ORDER NO. HAD8509264C0
A6

Service Manual

COMPACT disc DIGITAL AUDIO

DIGITAL

Compact Disc Player

SL-PJ11

Compact Disc Player

Color

(K) .... Black Type

Areas

[M] ..... U.S.A.
[MC] ... Canada
[E] ..... Switzerland and Scandinavia
[EK] .... United Kingdom
[XL] .... Australia
[EG] ... F.R. Germany
[EB] .... Belgium
[EH] .... Holland
[EF] .... France
[Ei] ..... Italy
[EC] .... Czechoslovakia
[XA] .... Southeast Asia, Oceania, Africa, Middle Near East and Central South America
[XM] ... Central South America
[PA] .... Far East PX
[PE] .... European Military
[PC] .... European Audio Club

■ SPECIFICATIONS

■ Audio

No. of channels:	2 (left and right stereo)
Frequency response:	4–20,000 Hz ±0.5 dB
Dynamic range:	more than 96 dB
S/N ratio:	more than 96 dB
Harmonic distortion:	0.002% (1 kHz, 0 dB)
Total harmonic distortion:	0.004% (1 kHz, 0 dB)
Channel separation:	more than 100 dB
Wow and flutter:	below measurable limit

■ Signal Format

Sampling frequency:	44.1 kHz
Correction system:	Technics Super Decoding Algorithm
D-A conversion:	16-bit linear

■ Pickup

Type:	Fine focus-one beam
	FF-1
Light source:	Semiconductor laser
Wavelength:	780 nm

■ Functions

Repeat play:	Entire disc and programmed tracks
Search:	Forward/backward track skip Forward/backward index skip Forward/backward manual search
Program play:	For up to 15 tracks
Display:	Total number of tracks, Programmed tracks, Current track Total playing time (min./sec.) Elapsed track playing time (min./sec.) Remaining number of tracks and playing time (when remaining time button is pressed) Programmed tracks (when memory/recall button id pressed during disc play) Index number
Disc loading:	Motor-driven horizontal type

Technics

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■ General

Power supply: For U.S.A. and Canada: AC120V, 60Hz
For United Kingdom and Australia: AC240V, 50Hz
For Continental Europe: AC220V, 50Hz
For Others: AC110~127/220~240V, 50/60Hz

Power consumption: 19 W
Output voltage: 2 V (at 0 dB)
Output impedance: Approx. 600Ω
Load impedance: more than 10 kΩ
Dimensions (W×D×H): 31.5×26.7×7.5 cm (12 13/32" × 10 1/2" × 2 15/16")
When disc holder is opened
39.7 cm (15 5/8") (D)
Weight: 3.5 kg (7.9 lbs.)

Specifications are subject to change without notice for further improvement.
Weight and dimensions are approximate.

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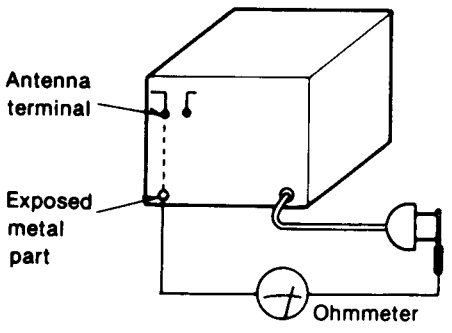
■ SAFETY PRECAUTION (This "safety precaution" is applied only in U.S.A.)

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

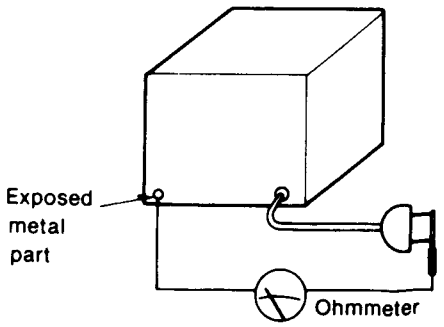
1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as screwheads, antenna, control shafts, handle brackets, etc. Equipment with antenna terminals should read between 3MΩ and 5.2MΩ to all exposed parts. (Fig. A) Equipment without antenna terminals should read approximately infinity to all exposed parts. (Fig. B)

Note: Some exposed parts may be isolated from the chassis by design. These will read infinity.



(Fig. A)

Resistance = 3MΩ—5.2MΩ



(Fig. B)

Resistance = Approx ∞

4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

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SL-PJ11

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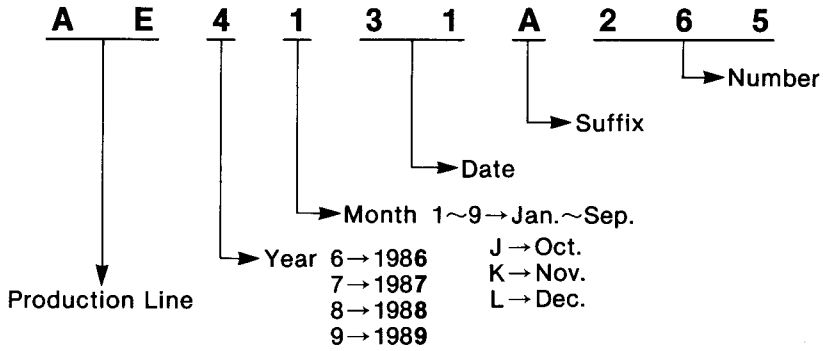
Please file and use this supplement manual together with the service manual for Model No. SL-PJ11, Order No. HAD8509264C0.

Note:

- This supplement has been issued to inform you that the optical servo P.C.B. has been changed in units having serial number suffixes "N" or later. (Refer to "How to read the serial number" shown below).

● How to read the serial number



■ REPLACEMENT PARTS LIST

Ref. No.	Change of Part No. OLD	NEW	Description	Remarks
VARIABLE RESISTOR				
VR106	——	**EVND1AA00B53**	Tracking Balance Adj., 5KΩ (B)	Addition
RESISTORS				
R112	ERDS2TJ333	**ERDS2TJ473**	Carbon, 1/4W, 47KΩ, ±5%	Change
R113	ERDS2TJ104	**ERDS2TJ154**	Carbon, 1/4W, 150KΩ, ±5%	Change
R114	ERDS2TJ474	**ERDS2TJ824**	Carbon, 1/4W, 820KΩ, ±5%	Change
R119	ERDS2TJ222	**ERDS2TJ152**	Carbon, 1/4W, 1.5KΩ, ±5%	Change
R191, 192	——	**ERDS2TJ102**	Carbon, 1/4W, 1KΩ, ±5%	Addition
CAPACITORS				
C117	RCBS1H681KBY	——	Ceramic, 50V, 680pF, ±10%	Deletion
C118	ECQM1H103JZ	——	Polyester, 50V, 0.01μF, ±5%	Deletion
C126	RCBS1H220JLY	**RCBS1H101KBY**	Ceramic, 50V, 100pF, ±10%	Change
C148	ECKD1H102KB	**RCBS1H102KBY**	Ceramic, 50V, 0.001μF, ±5%	Change
C191, 192	——	**RCBS1H820KBY**	Ceramic, 50V, 82pF, ±10%	Addition
C193, 194	——	**RCBS1H102KBY**	Ceramic, 50V, 0.001μF, ±5%	Addition

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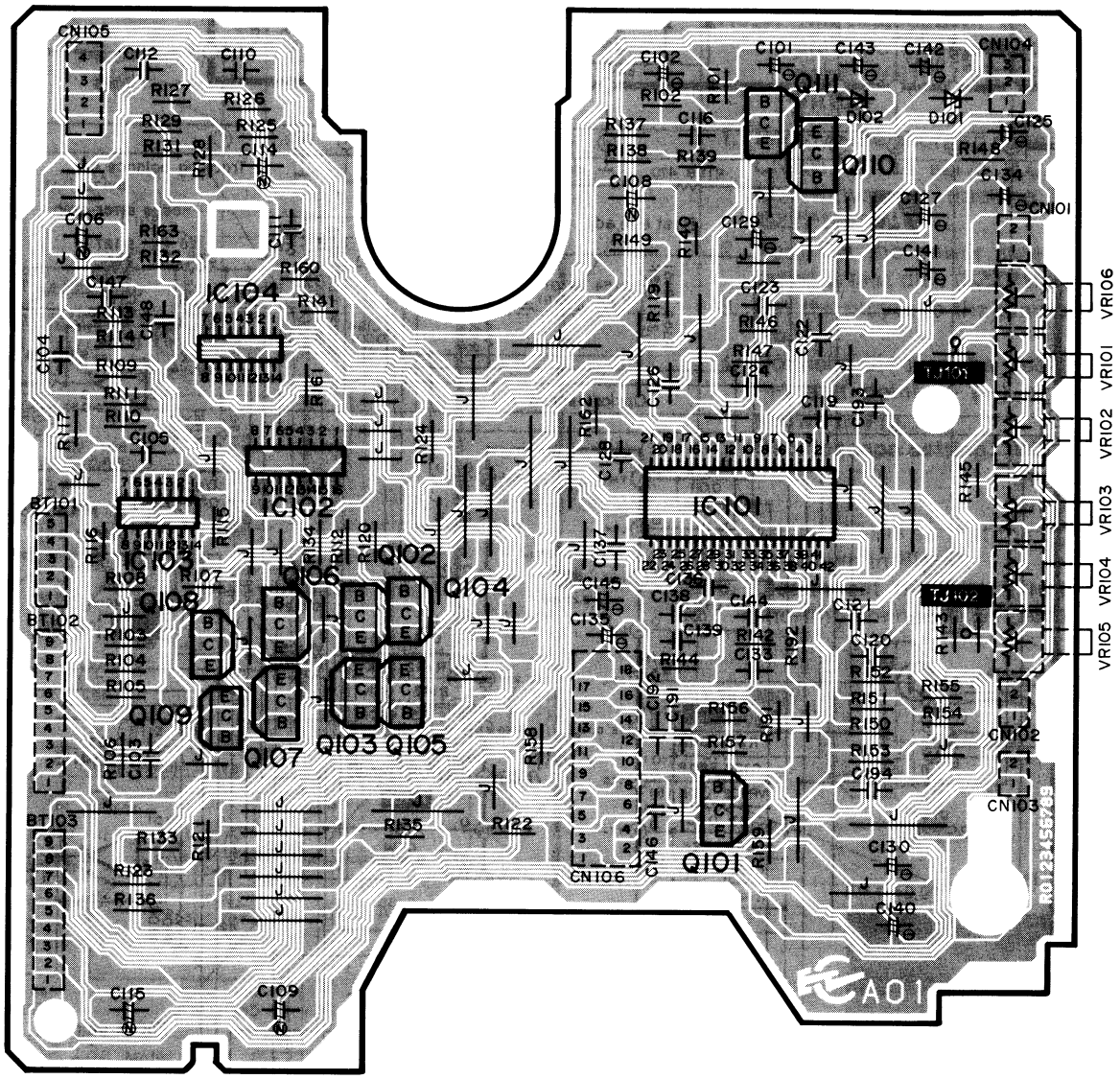
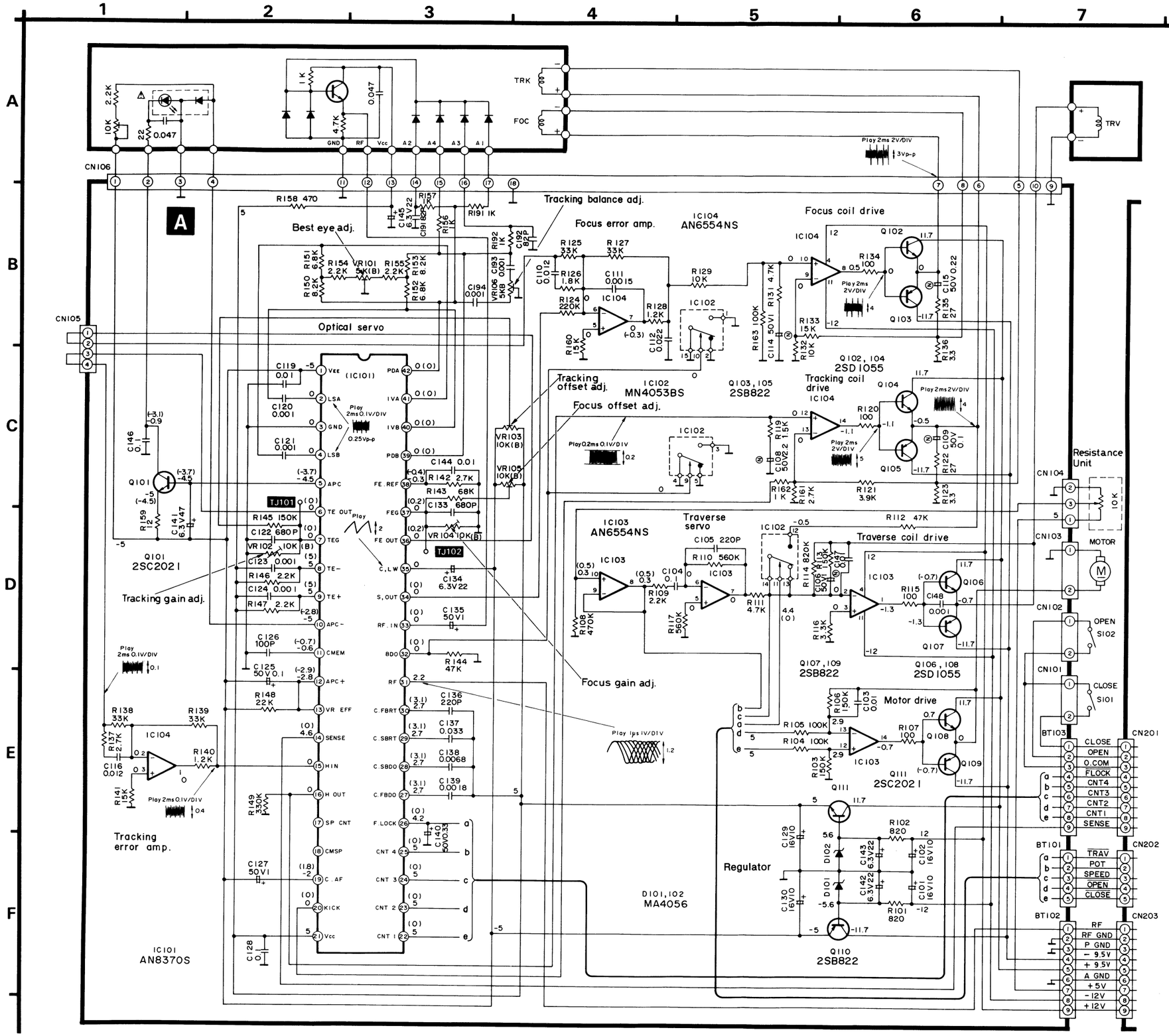
■ PRINTED CIRCUIT BOARD

A (Optical servo P.C.B.)



■ SCHEMATIC DIAGRAM (Optical servo circuit)



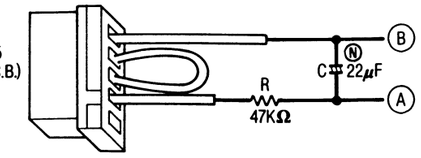
■ MEASUREMENTS AND ADJUSTMENTS

• Addition of tracking balance adjustment

TRACKING BALANCE ADJUSTMENT

Note: This adjustment must be done after all previous electrical adjustments have been done. (VR101, VR102, VR103, VR104 and VR105)

1. Remove the shorting connector from connector CN105 of the servo P.C.B. and connect the **test fixture** for tracking balance adjustment (**SZZP1053F**), to it.
2. Turn **ON** the power switch of the player and insert a test disc (**SZZP1014F** or **SZZP1054C**).
3. Set the player to the play mode and play **track No. 1**.
4. Connect CH-1 of the oscilloscope to point Ⓐ (+) and point Ⓑ (−) of the test fixture as shown in **Fig. A**.
   Oscilloscope setting: VOLT..... 20mV
   SWEEP ..... 1msec.
   INPUT ..... DC
5. Adjust **VR106** so that the DC voltage is **0±5mV** as shown in **Fig. B**.
6. Disconnect the test fixture, and reinsert the shorting connector to **CN105**.



Test fixture (SZZP1053F)

Fig. A

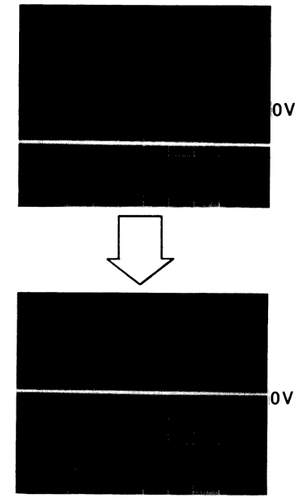


Fig. B

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Service Manual

Supplement

Compact Disc Player

SL-PJ11

COMPACT disc DIGITAL AUDIO

DIGITAL

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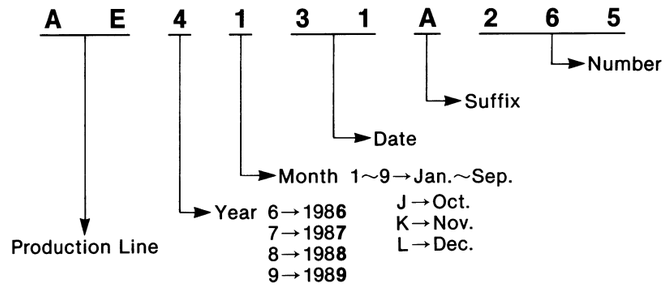

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■ PRINTED CIRCUIT BOARD

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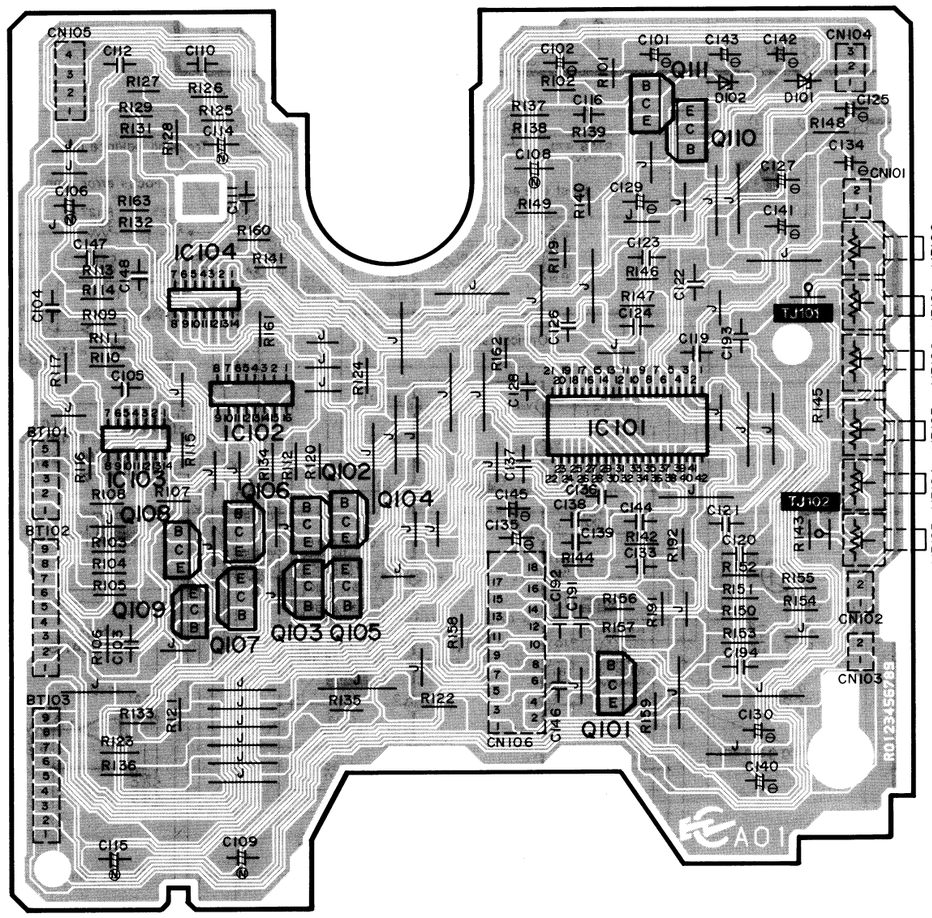
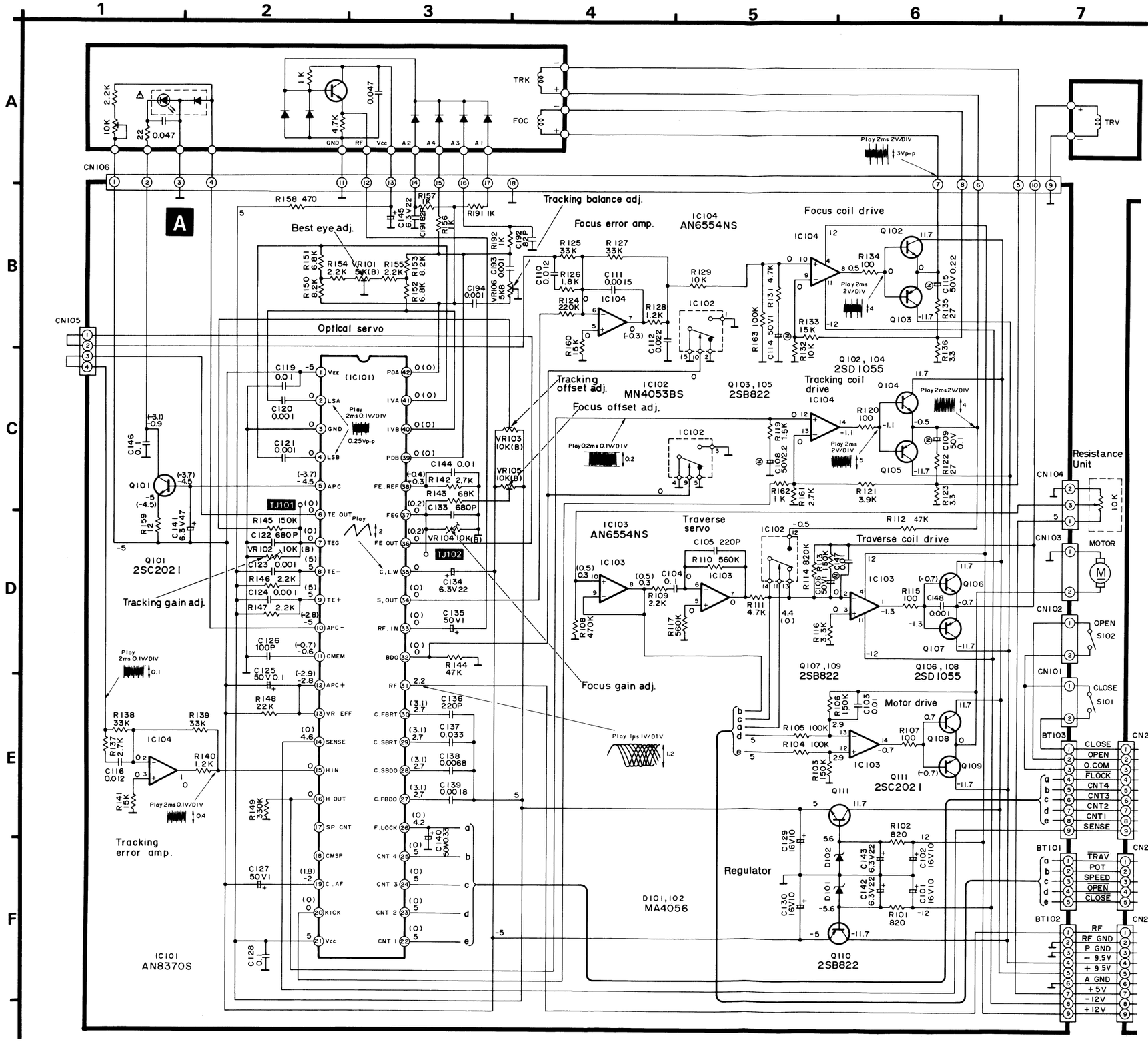


■ SCHEMATIC DIAGRAM (Optical servo circuit)



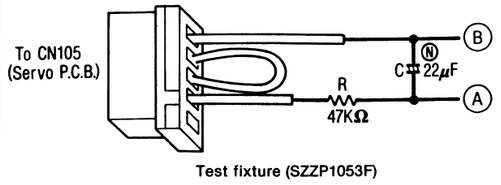
■ MEASUREMENTS AND ADJUSTMENTS

• Addition of tracking balance adjustment

TRACKING BALANCE ADJUSTMENT

Note: This adjustment must be done after all previous electrical adjustments have been done. (VR101, VR102, VR103, VR104 and VR105)

1. Remove the shorting connector from connector CN105 of the servo P.C.B. and connect the **test fixture** for tracking balance adjustment (**SZZP1053F**), to it.
2. Turn **ON** the power switch of the player and insert a test disc (**SZZP1014F** or **SZZP1054C**).
3. Set the player to the play mode and play **track No. 1**.
4. Connect CH-1 of the oscilloscope to point Ⓐ (+) and point Ⓑ (−) of the test fixture as shown in **Fig. A**.
   Oscilloscope setting: VOLT..... 20mV
   SWEEP ..... 1msec.
   INPUT ..... DC
5. Adjust **VR106** so that the DC voltage is **0±5mV** as shown in **Fig. B**.
6. Disconnect the test fixture, and reinsert the shorting connector to **CN105**.



Test fixture (SZZP1053F)

Fig. A

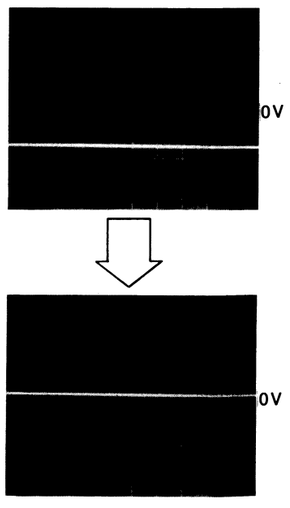


Fig. B

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ORDER NO. HAD8606605T0
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Technical Information

Supplement

PROCEDURE FOR IMPROVING THE PLAYABILITY OF THE REGULAR-SIZE CD PLAYER

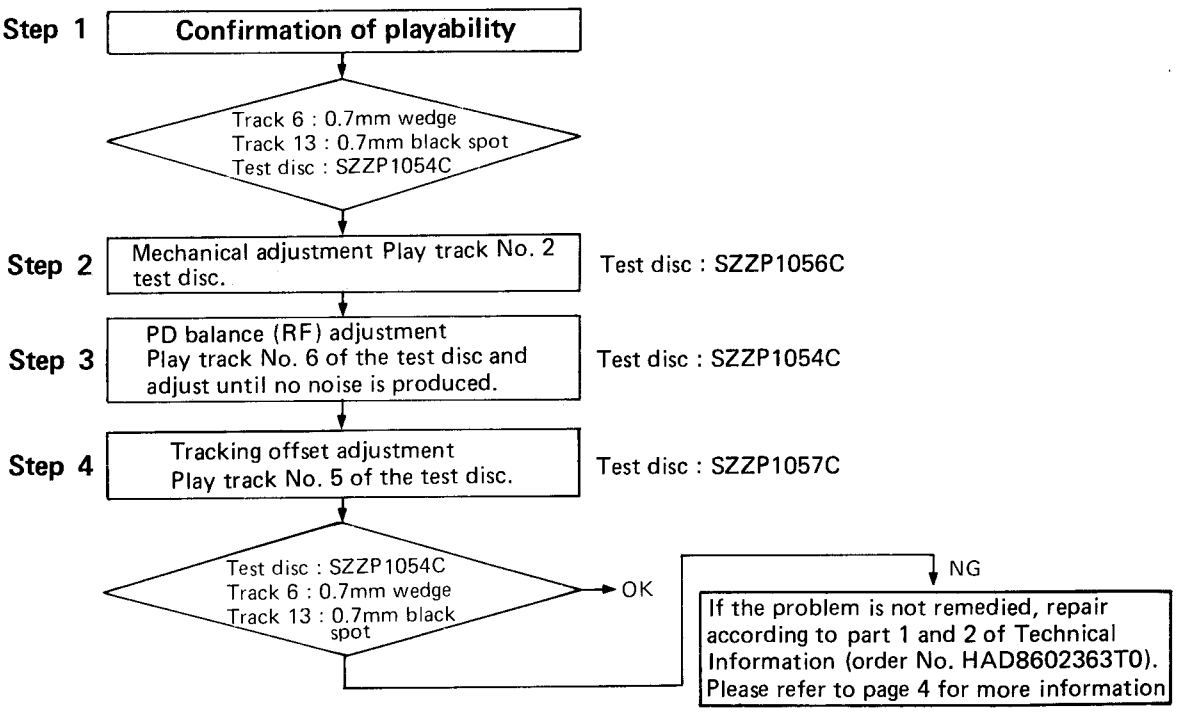
Models SL-PJ11, SL-P100, SL-P300, SL-P500, SL-P3620, CD-8956, AP500

If any of the following symptoms is detected, repair the unit according to the procedures described below. Repair is possible in most cases.

Symptoms

1. Skipped sounds during play.
2. Noise during play.
3. TOC is read, but the disc does not play.
4. Reading of the TOC is slow.
5. Turntable turns, but the TOC is not read.
6. Play starts too late after skipping.

Repair


Step 1
Confirmation of playability
Track 6 : 0.7mm wedge
Track 13 : 0.7mm black spot
Test disc : SZZP1054C
Step 2
Mechanical adjustment Play track No. 2 test disc.
Test disc : SZZP1056C
Step 3
PD balance (RF) adjustment
Play track No. 6 of the test disc and adjust until no noise is produced.
Test disc : SZZP1054C
Step 4
Tracking offset adjustment
Play track No. 5 of the test disc.
Test disc : SZZP1057C
Test disc : SZZP1054C
Track 6 : 0.7mm wedge
Track 13 : 0.7mm black spot
OK
NG
If the problem is not remedied, repair according to part 1 and 2 of Technical Information (order No. HAD8602363T0).
Please refer to page 4 for more information

Step 1 Confirmation of Playability

1. Play back track 3 through 15 of the test disc (SZZP1054C) for 10 seconds each.
2. Check for tracks in which sound is skipped or noise is generated.
3. Conditions for evaluating playability.

Track No. 6 : 0.7mm or smaller wedge
Track No. 13 : 0.7mm or smaller black spot

Note : If the 0.7mm wedge or black spot causes sysmtoms, perform the adjustments in step 1 through 3. Adjust so that wedges or black spots of 0.7mm or smaller pose no problems in playback.

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Step 2 Mechanical Adjustment

1. Set up the CD player as shown in Fig. 1 and play track No. 3 of the test disc (SZZP1056C). Connect the oscilloscope to TJ702 (RF test pin) and TJ701 (RF ground).
2. Set up the CD player as shown in Fig. 2 and remove the servo circuit board. (Be careful no to bump the set.)

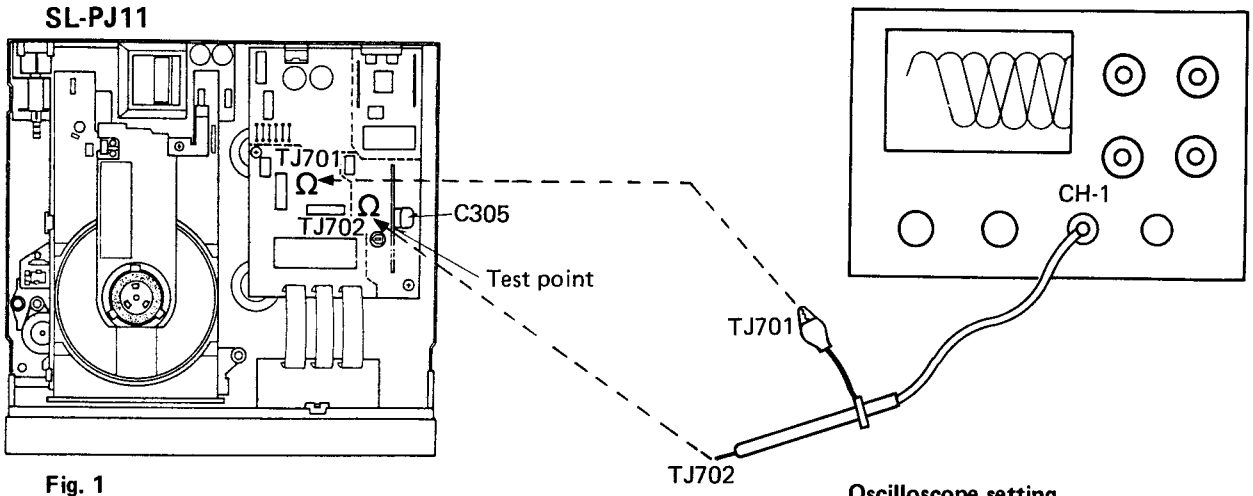
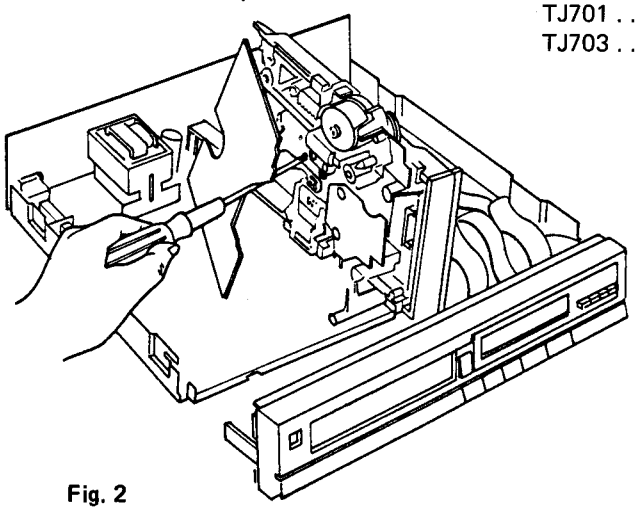


Fig. 1

Note : SL-P100, P300, P500
SL-P3620, CD8956, AP500
TJ701 . . . RF (+)
TJ703 . . . GND

Oscilloscope setting
Volt 500mV
Sweep . . . . . 0.5 μs
Input select . . . . . AC



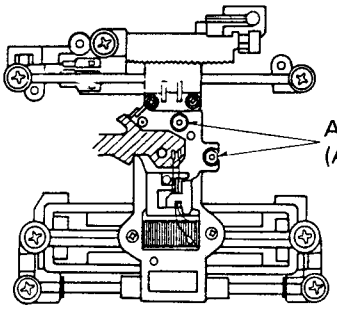
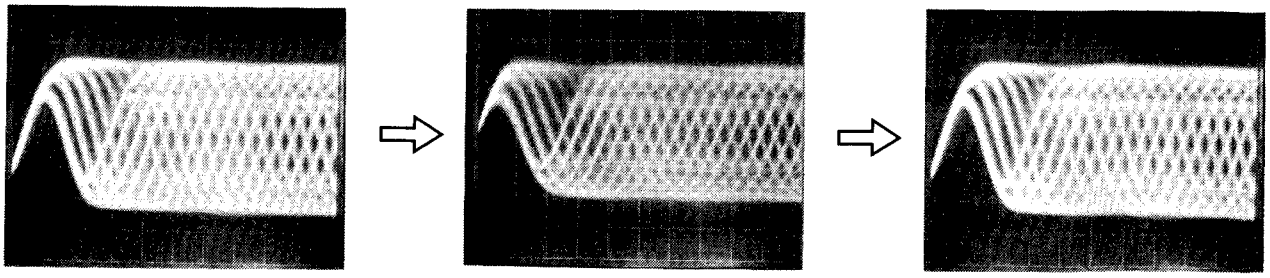


Fig. 2

3. Turn the two adjustment screws on the optical pickup as shown in the figure to maximize the RF waveform and minimize the vertical jitter.
4. After adjustment, set up the CD player as shown in fig. 1.



(A) (B) (C) OK

Fig. 3

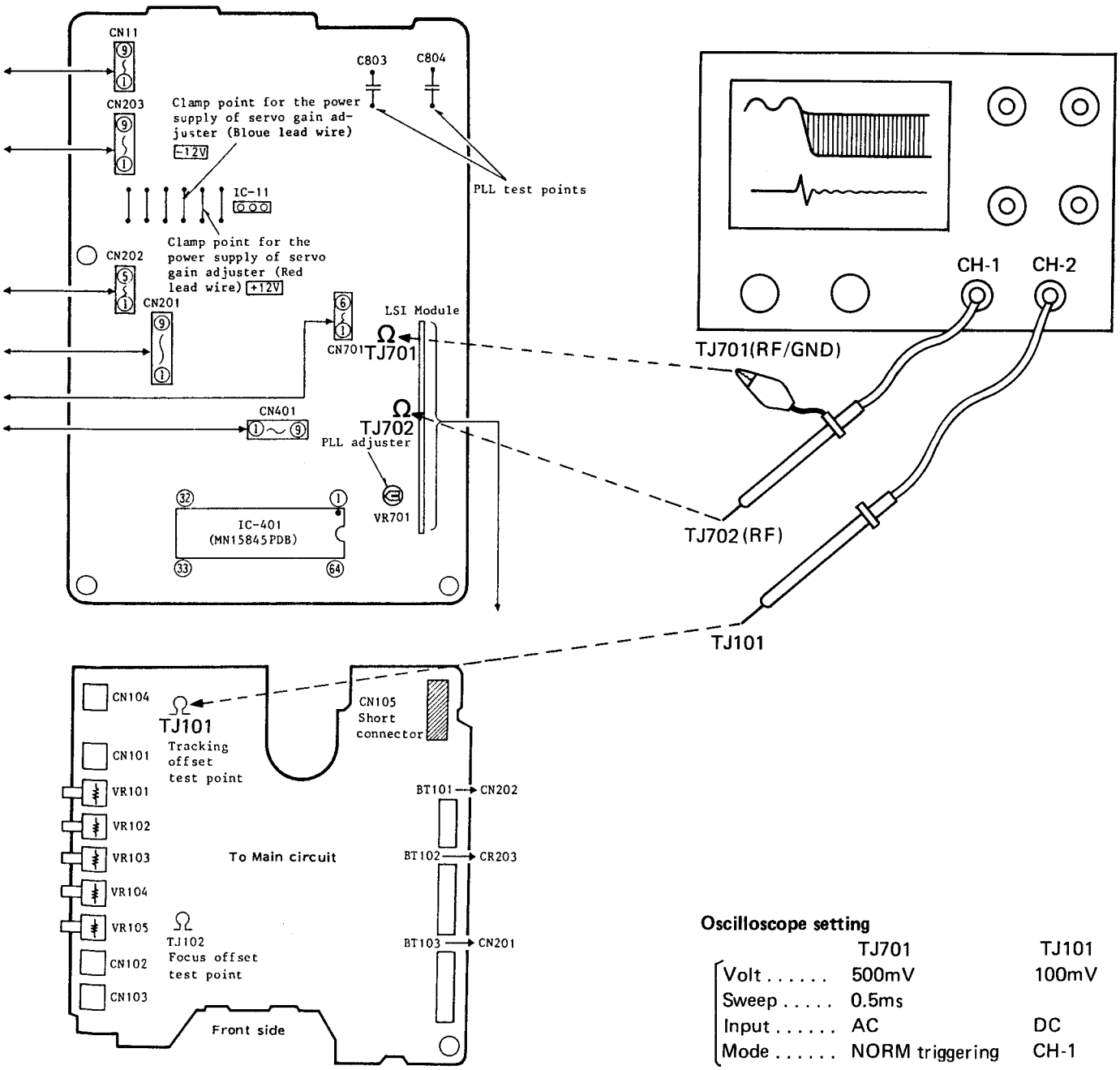
Step 3 RF Adjustment (PD Balance)

1. Play the test disc (SZZP1054C). (Monitor the sound through the speakers.)
2. Play track No. 6 (0.7mm wedge).
3. Turn VR101 to where the noise disappears.
   (Play back the tracks in which noise is produced and adjust until the noise is minimum.)

Note : If noise is not disappeared, adjust VR101 until the RF waveform becomes as shown in Fig. 3 (C).

Step 4 Tracking Offset Adjustment

1. Connect an oscilloscope to the CD player as shown in Fig. 4.

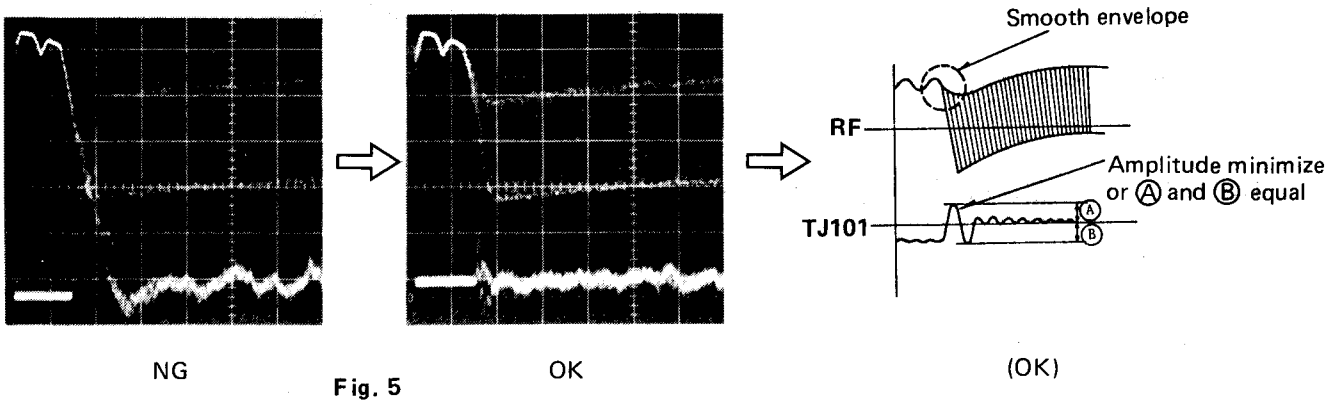


Oscilloscope setting

	TJ701	TJ101
Volt	500mV	100mV
Sweep	0.5ms	
Input	AC	DC
Mode	NORM triggering	CH-1

Fig. 4

2. Play track No. 5 of the test disc (SZZP1057C).
3. Output the following waveform and adjust VR103 so that the point specified in Fig. 5 becomes flat for channel 1 and as small as possible for channel 2.



NG OK (OK)

Fig. 5

Note : After performing step 1 through 3, reconfirm playability by making sure the 0.7mm wedge and black spot pose no problems.

PART II (REFERENCE)

Step 1 thru 4 are quite enough for nearly perfect servicing.
To further improve the playability, take the following actions.

1 Add and adjust the tracking offset compensation PCB.

Refer to pages 16 ~ 19 & 30 in T/I HAD8602363T0.

Parts concerned

SXPD530 .... Tracking offset Compensation P.C.B.
SHRD16 ..... PCB Holder
SZZP1053C ... Fiter Ass'y

Test Disc : SZZP1054C
Track No. 6 : 0.7mm Wedge
Track No. 13 : 0.7mm Black Spot

→ OK

NG

2 Replace and adjust the optical pickup (4PD → 6PD).

Refer to pages 13 ~ 15 & 19 ~ 30 in T/I HAD8602363T0.

Test Disc : SZZP1054C
Track No. 6 : 0.7mm Wedge
Track No. 13 : 0.7mm Black Spot

→ OK

Note : As charted above, add the trackinging offset compensation PCB first. This addition and adjustment provides for a satisfying level in pleyability. The optical pickup replacement is only expected when a client asks you to further improve the playability.

Printed in Japan
860603000 Ⓚ KM

ORDER NO. HAD8604466P0

Parts Change Notice

Model No. SL-PJ11 [MC, PA, PE, PC, E, EB, EH, XB]

Service Manual Order No. HAD8509264C0

Please revise the original parts list in the Service Manual to conform to the change (s) shown herein. If new part numbers are shown, be sure to use them when orderring parts.

Reason for Change *The circled item indicates the reason. If no marking, see the Notes in the bottom column.

1. Improve performance	
2. Change of material or dimension	
3. To meel approved specification	
4. Standardization	
5. Addition	
6. Deletion	
7. Correction	
8. Other	

Interchangeability Code **The circled item Indicates the interchangeability. If no marking, see the Notes in the bottom column.

	Parts		Set Production	
A	Original	⇄	Early	Original or new parts may be used in early or late production set. Use original parts until exhausted, then stock new parts.
	New		Late	
B	Original	→	Early	Original parts may be used in early production sets only. New parts may be used in early or late production sets. Use original parts where possible, then stock new parts.
	New	↗	Late	
C	Original	↗	Early	New parts only may be used in early or late production sets. Stock new parts.
	New	→	Late	
D	Original	→	Early	Original parts may be used in early production sets only. New parts may be used in late production sets only. Stock both original and new parts.
	New	→	Late	
E	Other			

Part Number

Model No.	Ref. No.	Original Part No.	New Part No.	Notes (*'**)	Part Name & Descriptions	
SL-PJ11	A1 [MC]	SQUD45E	SQULPJ11–KMC	7, C	Instruction Book	1
SL-PJ11	A1 [PA, PE, PC]	SQUD50E	SQULPJ11–KPA	7, C	Instruction Book	1
SL-PJ11	A1 [E, EB, EH]	SQUD51E	SQULPJ11–KE	7, C	Instruction Book	1
SL-PJ11	A1 [XB]	SQUD46	SQULPJ11–KXB	7, C	Instruction Book	1

File this Parts Change Notice with your copy of the Service Manual.

Technics

Matsushita Electric of Canada Limited
5770 Ambler Drive, Mississauga, Ontario, L4W 2T3

Matsushita Electric Trading Co., Ltd.
P.O. Box 288, Central Osaka Japan

Panasonic Tokyo Office
Matsushita Electric Trading Co., Ltd.
6th Floor, World Trade Center Bldg., No. 4-1, Hamamatsu-cho 2-Chome, Minato-ku, Tokyo 105, Japan

Printed in Japan
860400300 Ⓚ AM

ORDER NO. AD8808017P0

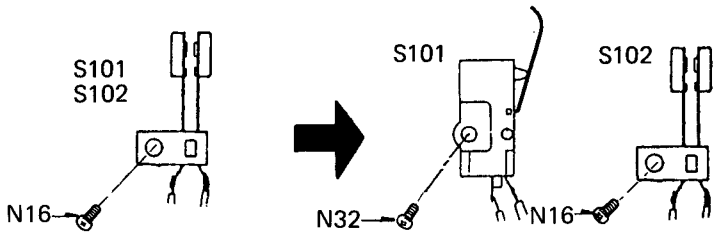
Parts Change Notice

Model No. SL-PJ1 SL-PJ2 [E, EK, XL, EG, EB, EH, EF, Ei, XA, XZ]

Please revise the original parts list in the Service Manual to conform to the change (s) shown below. If new part numbers are shown, be sure to use them when ordering parts.

Reason for Change *The circled item indicates the reason. If no marking, see the Notes in the button column.

1. Improve performance
2. Change of material or dimension
3. To meet approved specification
4. Standardization
5. Addition
6. Deletion
7. Correction
8. Other



Interchangeability Code **The circled item Indicates the interchangeability. If no marking, see the Notes in the bottom column.

	Parts		Unit Production	
A	Original	→	Early	Original or new parts may be used in either early or late production units. Use original parts until the supply is exhausted, then stock new parts.
	New	→	Late	
B	Original	→	Early	Original parts may be used in early production units only. New parts may be used in either or late production units. Use original parts where possible, then stock new parts.
	New	→	Late	
C	Original	→	Early	New parts are to be used in both early and late production units. Stock new parts only.
	New	→	Late	
(D)	Original	→	Early	Original parts must be used in early production units. New parts must be used in late production units only. Stock both original and new parts.
	New	→	Late	
E	Other			

Part Number Information

Model No.	Ref. No.	Original Part No.	New Part No.	Notes(*,**)	Part Name & Description	Q'ty
SL-PJ1 / SL-PJ2	S101	SRDSBSW–180	SFDSC02N03	7, D		1
	N16	XTN2+6B	————	6, D	(2 → 1)	1
	N32	————	XTN16 + 10G	5, D	(S101)	1

Please file this parts change notice with your copy of the Service Manual for model No. SL-PJ1 , Order No. HAD85042480C0.
SL-PJ2 , Order No. HAD85042479C0.

Technics

Matsushita Electric Industrial Co., Ltd.
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Tokyo 105, Japan

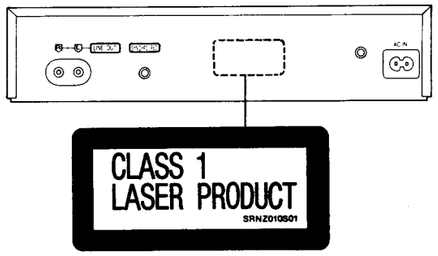
Printed in Japan
K880900230TK

■ PRECAUTION OF LASER DIODE

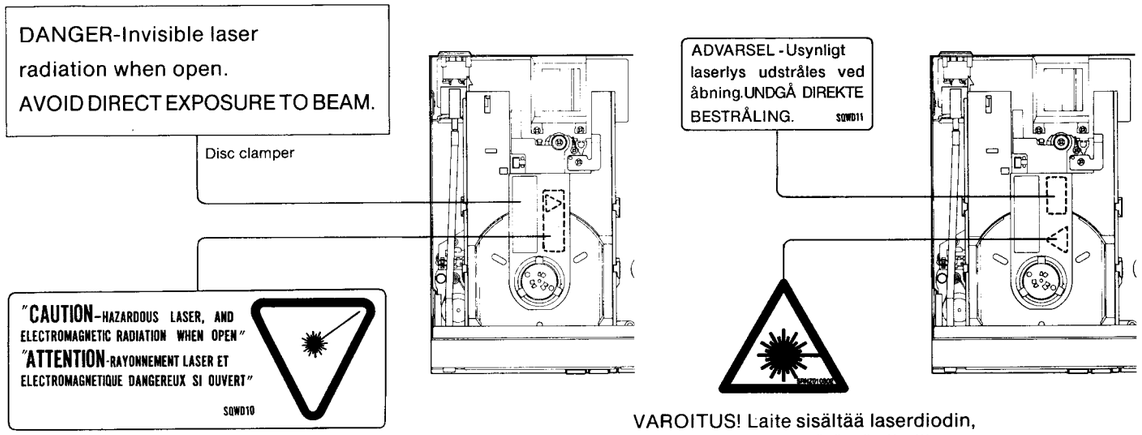
Caution: This product utilizes a laser diode.
ADVARSEL: I dette a apparat anvendes laser.

- **Use of caution labels** Note: ○ Mark is used, × Mark is not used.

Areas	Disc clamper	SQWD10	SQWD11	SRNZ010S01	SRNZ010S02
[M], [XA], [XM] [EC], [PA], [PE] [PC]	○	×	×	×	×
[MC]	○	○	×	×	×
[E]	○	×	○	○	○
[EK], [XL], [EG] [EB], [EH], [EF] [Ei]	○	×	×	○	○



Obs:
Apparaten innehåller laser
Komponent av höger laserklass
än klass 1.

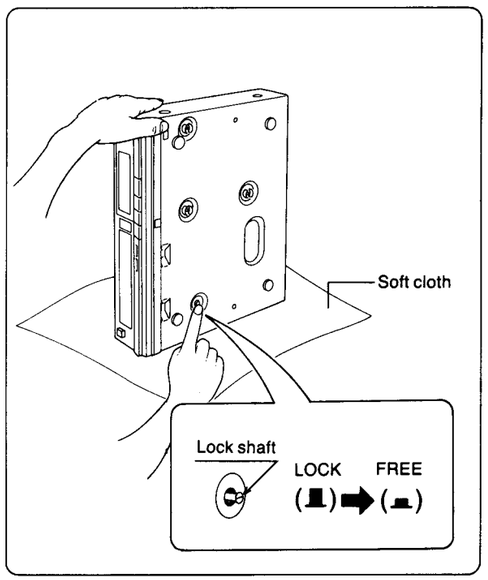

DANGER-Invisible laser radiation when open.
AVOID DIRECT EXPOSURE TO BEAM.
Disc clamper
"CAUTION-HAZARDOUS LASER, AND ELECTROMAGNETIC RADIATION WHEN OPEN"
"ATTENTION-RAYONNEMENT LASER ET ELECTROMAGNETIQUE DANGEREUX SI OUVERT"
SQWD10
ADVARSEL - Usynligt laserlys udstråles ved åbning. UNDGÅ DIREKTE BESTRÅLING.
SQWD11

VAROITUS! Laite sisältää laserdiodin, joka lähettää näkymätöntä silmille vaarallista lasersäteilya

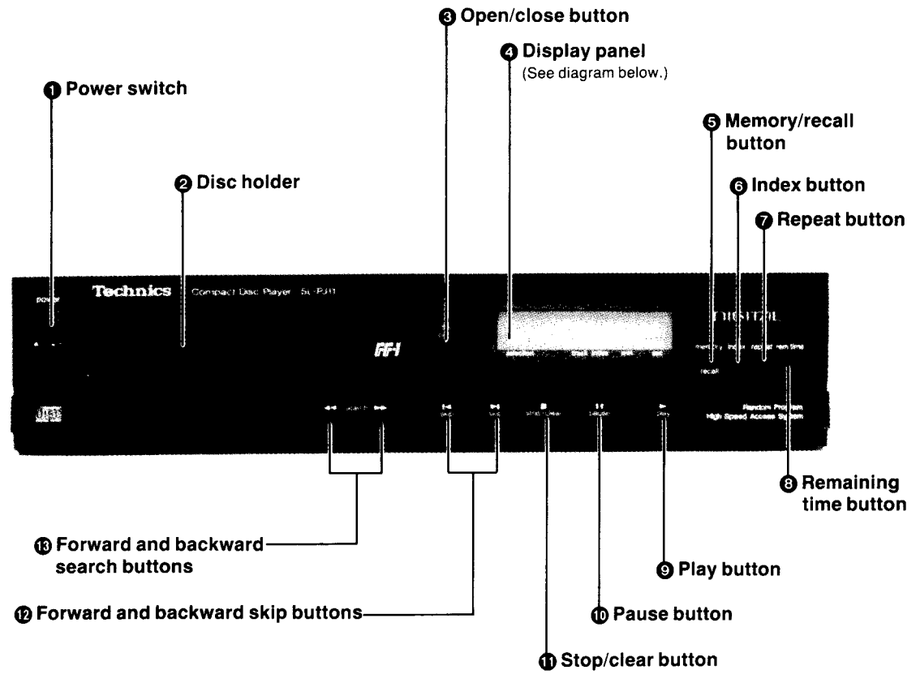
■ BEFORE USING THIS UNIT

1. Place a soft cloth under the unit to protect it from scratches.
2. Press the lock shaft on the bottom panel to the in position (🔒→🔓).

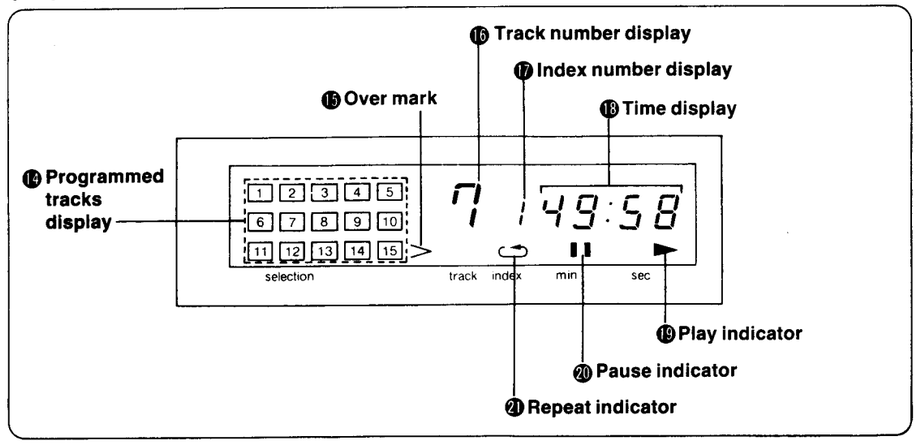
NOTE:
IF THE PLAYER IS TRANSPORTED AGAIN, PERFORM THE FOLLOWING, STEPS:
1) Remove the disc from the holder.
2) Press the lock shaft to the out position (🔓→🔒).
CAUTION:
Do not transport the player without locking the lock shaft. Severe damage will result.



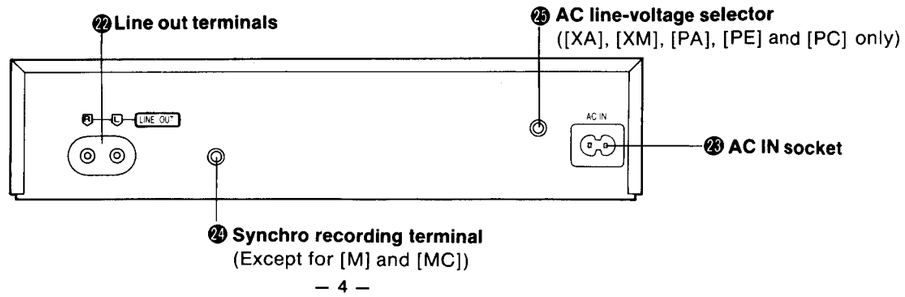
■ LOCATION OF CONTROLS



(Display panel section)



(Rear panel)


㉒ Line out terminals
㉕ AC line-voltage selector
([XA], [XM], [PA], [PE] and [PC] only)
LINE OUT
AC IN
㉓ AC IN socket
㉔ Synchro recording terminal
(Except for [M] and [MC])

■ FUNCTIONS

❶ Power switch
- Press (⏻) to switch power on and press again (⏻) to switch power off.

❷ Disc holder
The disc is inserted in this holder with the label side up.

❸ Open/close button
Press this button to open and close the disc holder.
When this button is pressed, the disc holder slides out. Press this button again to close the disc holder.

❹ Display panel

❺ Memory/recall button
Press this button to perform the following two functions.
1. To place a track number in the memory **(program disc play function)**.
   (The memory can hold up to 15 tracks in any order.)
2. To display memory contents in order during program play **(program check function)**.

❻ Index button
Press this button to specify an index number instead of a track number.
Note:
Numbers higher than 19 cannot be used when entering an index number.

> **Index:**
> In some compact discs, indexes are used to divide tracks into smaller sections for easy access. If a disc includes indexes, a list of the indexes will be contained in the liner note included with that disc.

❼ Repeat button
Press this button to activate the repeat mode.
- When this button is pressed, the repeat mode is activated.
- If this button is pressed after a program has been entered, the programmed tracks will be played repeatedly.
- Press this button again to cancel the repeat mode. It is also possible to cancel the repeat mode by pressing the stop/clear button, but this will cancel all other settings as well.

❽ Remaining time button (rem time)
Press this button while a disc is being played to display the remaining playing time (min. and sec.) of a disc.
When this button is pressed, the display switches to the remaining time display mode. Press this button again to return to the elapsed playing time mode.

Note:
During program play, the display will not switch to the remaining time display mode when this button is pressed.

❾ Play button
Press this button to begin disc play.
When this button is pressed during disc play, the pickup returns to the beginning of the first track and starts playing the disc again.
During program disc play, the pickup returns to the first programmed track and starts playing the programmed sequence again if this play button is pressed **(auto return play function)**.

> **Pickup:**
> The pickup is the device that reads the information on the disc surface using a laser. The pickup moves across the disc as the disc is played, but it is not visible from the outside of the cabinet.

❿ Pause button
Press this button to briefly stop disc play.
- When this button is pressed, the player switches to the pause mode.
- To continue disc play, press the play button.

⓫ Stop/clear button
Press this button to stop disc play.
When this button is pressed, all previous settings are cancelled and the player returns to the **stop mode**.

Stop mode:
In the stop mode, the pickup is at the beginning of the first track and the display shows the total number of tracks and total playing time of the disc.

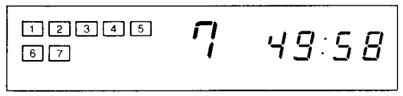
⓬ Forward and backward skip buttons
Use these buttons to perform the following three operations.
1. **To start disc play from a specific track or index number (random access play).**
   Press either skip button before starting disc play.
2. **To program track numbers before starting disc play (program play).**
   Press either skip button before starting disc play.
3. **To move to the beginning of a specific track or index (skip play).**
   Press either skip button during disc play or the pause mode.

> - Press the forward skip button to move forward (to higher track/index numbers).
> - Press the backward skip button to move backward (to lower track/index numbers).
> - The number of times either button is pressed determines the number of the track/index to be entered or the number of tracks/indexes to be skipped. Use these buttons while watching the pickup location on the display panel. (See pages 12 and 13 for details.)

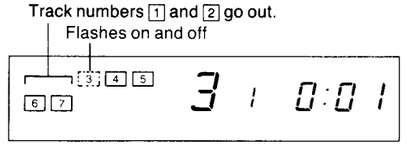
⓭ Forward and backward search buttons
Use these buttons to move the pickup forward or backward (manual search play function).
- Use the search buttons when the player is in the pause mode or during disc play to move the pickup to a specific point on the disc.
- When either of these buttons is pressed, the pickup will move slowly at first and then rapidly if the button is held down for more than about three seconds.
- Press the forward search button to move the pickup forward.
- Press the backward search button to move the pickup backward.
  Release the search button when the pickup has moved to the desired location (as shown by the display panel).
- During disc play, search can be performed while listening to the signal from the disc to aid in locating a specific point. The output level is decreased by 12 dB (¼) compared with the normal level.

⓮ Programmed tracks display
The programmed tracks display has the following three display modes.

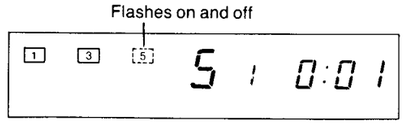
1. **When a disc is loaded, this display shows the total number of tracks and playing time on the disc.**



2. **When a track number is specified before the start of disc play, the track number flashes on and off.**
   For example, the diagram below shows that disc play is to begin from track 3.



   During disc play, the track number currently being played flashes on and off.
3. **When track numbers are programmed before the start of disc play, the programmed track numbers flash on and off.**
   For example, the diagram below shows that tracks 5, 3 and 1 are to be played. During disc play, the number of the track currently being played flashes on and off.
   When disc play has ended, the programmed tracks display goes out.



⓯ Over mark (>)
Illuminates when a disc having more than 15 tracks is loaded.

⓰ Track number display
Track numbers up to 99 are shown here.

⓱ Index number display
Index numbers up to 19 are shown here.
- On discs having no indexes, this display will read "i".
- If an index number higher than 19 is encountered, this display will read "F".

⓲ Time display
This display shows the playing time in minutes and seconds.
If the remaining time button is pressed during normal disc play, this display shows the remaining playing time until the end of the disc.

⓳ Play indicator (▶)
Illuminates when the play button is pressed and goes out when disc play is stopped.

⓴ Pause indicator (❚❚)
Illuminates when the pause button is pressed and goes out when the pause mode is cancelled.

㉑ Repeat indicator (⮌)
Illuminates when the repeat button is pressed to activate the repeat mode and goes out when the repeat mode is cancelled.

㉒ Line out terminals (LINE OUT)
These are the audio output terminals.
- Connect the line out terminals to the AUX/CD/VIDEO or TAPE PLAYBACK terminals on your amplifier or receiver.
- Do not connect to the amplifier PHONO terminals.

㉓ AC IN socket (AC IN)
Connect this socket to a wall socket using the power cord.

㉔ Synchro recording terminal (SYNCHRO REC)

> **The following functions are possible when this terminal is used:**

Synchro recording function

Use the MINI-PHONE cord (option) for the synchro rec connection.
- Recording can be synchronized with the beginning and end of disc play and pause operation. Note that this is only possible when using Technics cassette decks which are equipped with a CD-SYNCHRO recording terminal and Technics amplifiers which are equipped with a synchro recording terminal compatible with compact disc players.

Direct operation function

- The amplifier input source can be automatically switched to AUX/CD/VIDEO when the play button is pressed. It is also possible to automatically start disc play when the amplifier input source selector is switched to AUX/CD/VIDEO.
  Note that this is only possible when using Technics amplifiers which have a direct operation function.

㉕ AC line-voltage selector

■ CONCERNING COMPACT DISCS

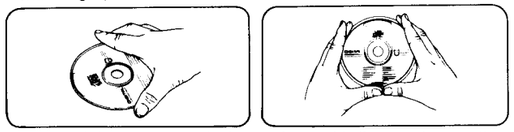
Handling precautions

Only compact discs having this mark can be used with this player.

COMPACT disc DIGITAL AUDIO

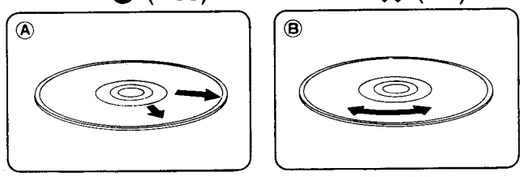
Observe the following precautions to enjoy the same outstanding sonic performance from your compact discs for many years.

- Hold compact discs by the edges so the surface is not soiled with fingerprints.



- Be careful not to scratch the surface with fingernails or other sharp objects, particularly when inserting and removing discs from their cases.
- Do not bend the disc.
- Do not use record cleaning sprays or static electricity prevention liquids.
- Do not wipe with benzine, thinner or any other solvent. If the surface is soiled, wipe gently with a soft, damp (water only) cloth.
- When wiping discs, always move the cloth directly outward from the center of the disc, not in a circular motion as with standard phonograph records.

O (Yes) ✕ (No)



(In compact discs, a circular scratch along a line of pits is more likely to cause errors than a straight scratch across many lines of pits.)

- If the disc is brought from a cold environment into a warm room, moisture may form on the disc. Wipe this off with a soft, dry cloth before using the disc.
- Do not try to dry discs with a hair dryer.
- Do not write on the label side with a ball-point pen, hard pencil or other writing utensil.
- Handle compact discs with care. Fingerprints, dirt and scratches can cause skipping and distortion.

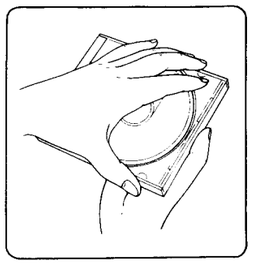
Storage precautions

- Be sure to store discs in their cases to protect them from dust, scratches and warping.
- Do not place or store discs in the following places:
  1) Locations exposed to direct sunlight.
  2) Locations with high humidity or a lot of dust.
  3) Locations directly exposed to a heat outlet or heating appliance.
  4) In the glove compartment or rear ledge of an automobile.

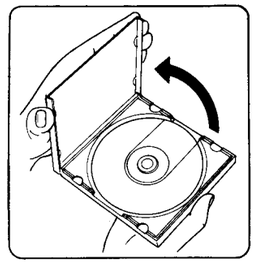
Compact disc storage case

Compact disc cases are standardized worldwide. The directions below on handling cases are the basic rules for all compact discs.

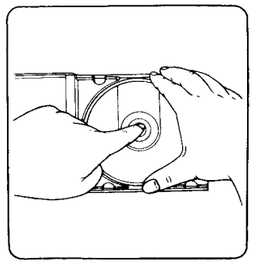
Removing a disc



1 Hold both sides of the bottom section with your right hand and the top section with your left hand.

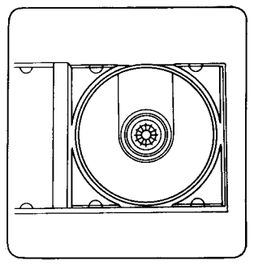


2 Open the top section as shown. (The disc should be stored with the label facing upward.)

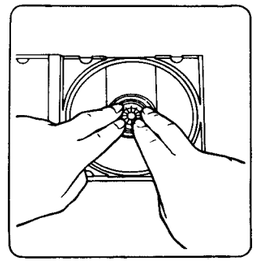


3 Press down on the spindle hole with left index finger and pick up the disc with your right hand.

Replacing a disc in its case



1 Place the disc in the case so the spindle hole is over the holder.

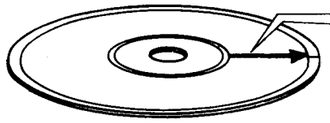


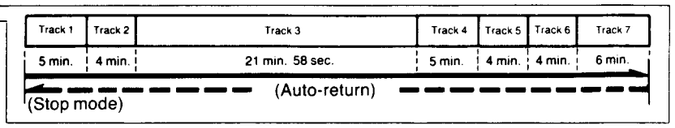
2 Press downward to firmly seat the disc in the case.

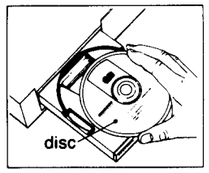
Playing a disc

The following explanation is for a disc containing 7 tracks having a total playing time of 49 minutes and 58 seconds. (Remember that, unlike phonograph records, compact discs are played from the center outward.)

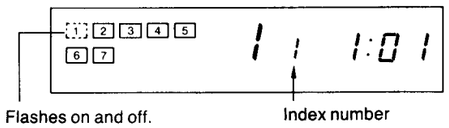
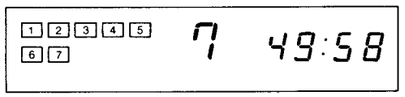
■ Automatic play





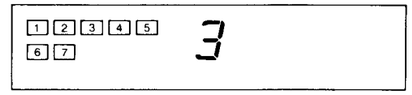
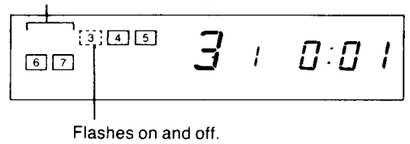
Procedure (Press all buttons firmly.)	Function/Notes
■ To play a disc from beginning to end	
1 power ☐ **Press(▙ ▁ ▀).** ▙ off ▀ on	•Display illuminates as shown below. 00 00:00
2 ⏏ open/close **Press.**	•Disc holder opens.
3  **Insert a disc with the label side facing upward.**	**Notes:** •Insert the disc only after the disc holder has opened all the way. If the disc is inserted too soon, it may be damaged. •Do not tilt the player while the disc holder is opening or closing since the disc could fall out of the holder.
4 ⏏ open/close **Press.**	•Step 4 can be skipped by pressing the play button after inserting a disc. In this case, the holder will close and disc play will begin immediately from track 1 but the tracks and total playing time will not be displayed.
	•Disc data are being read. 00:00
	1 2 3 4 5 6 7 7 49:58

Go to next page.

Procedure	Function/Notes
5 ▶ play **Press.**	•The play indicator (▶) illuminates and disc play begins. 
•If the play button is pressed during disc play, disc play is started again from the first track (**auto-return play function**).	•When a disc having no indexes is played, " / " is constantly displayed in the index section. •A maximum of 99 tracks can be displayed.
After the disc has been played. •Remove the disc from the disc holder.	•When the end of the disc is reached, the pickup returns to the beginning of track one and the player switches to the stop mode. 
6 power **Press.** off on	
•Turn off the power if the player is not to be used again for a while.	
•Since steps 1, 2, 3, 4 and 6 in this procedure are the same for all disc play procedures, they are not included in the following explanations.	
■ To briefly interrupt disc play	
❚❚ pause **Press.**	•The play indicator goes out, the pause indicator illuminates and the player switches to the pause mode.
▶ play **Press the play button to resume disc play.**	•The pause mode is cancelled and disc play is resumed. (Pause indicator goes out and play indicator illuminates.)
■ To stop disc play	
■ stop/clear **Press.**	•The pickup will return to the beginning of the first track and the player will switch to the stop mode.

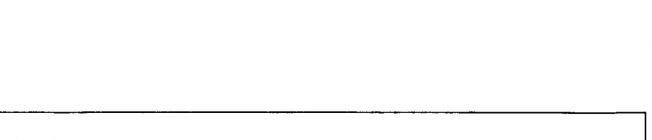
Random access play (1-1, 1-2)

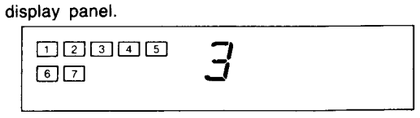
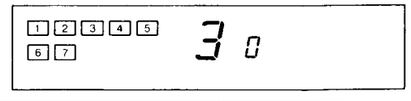
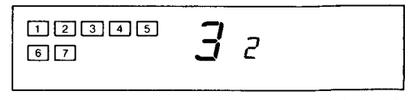
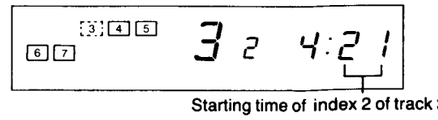
1-1. Track random access

Procedure (When player is in the stop mode.)	Function/Notes
■ Example: To play a disc from track 3.	•Track 3 is shown in the display panel. 
1 ▶❚ skip **Press three times.**	
2 ▶ play **Press.**	•The play indicator (▶) illuminates and disc play begins from track 3. Track numbers 1 and 2 go out. 

1-2. Index random access (When specifying an index number obtained from the disc's liner note)

■ Example: To start disc play from the beginning of index 2 of track 3 (having a total of 5 indexes) to the end of the disc.



Procedure (When player is in the stop mode.)	Function/Notes
1 ▶❚ skip **Press three times.**	•Confirm that the desired track and index numbers are shown in the display panel. 
2 index **Press.**	
	•When playing discs having only one track, remember to enter track number 1.
3 ▶❚ skip **Press twice.**	•Enter index 2. 
4 ▶ play **Press.**	•Play indicator illuminates and disc play is started from index 2 of track 3. 
Program disc play using index numbers is not possible.	

Program disc play (2-1, 2-2)

2. Program disc play

Note:
- Program entries cannot be made during disc play.
- Program disc play is not possible using index numbers.
- If you make a mistake, press the stop/clear button to cancel that entry and enter the number again.
- If a track number higher than the last one on the disc is entered while the disc holder is open, the display panel reads "E" (error).

Procedure (When player is in the stop mode.) Proceed as shown by the arrows.	Function/Notes
2-1 Single program **■ To play one track from beginning to end:** **Example:** To play track 3 from the beginning. Press three times. skip → memory recall → play Specify track 3 — Program Disc play begins from track 3. Track 1 | Track 2 | Track 3 | Track 4 | Track 5 | Track 6 | Track 7 (Auto-return)	Track number display 3 1 0:01 Flashes on and off. (All other track numbers go out.) •Holding the forward skip button down causes the track number to continuously increase. Confirm that the desired number is shown in the display before pressing the play button. •This function is particularly useful for saving time when starting disc play from a track near the end of a disc.
2-2 Multi-program **■ To play several tracks out of order:** **Example:** To play track 3, track 5 and track 1 in that order. Press three times. Press twice. skip → memory recall → skip → memory recall Specify track 3 — Program — Specify track 5 (3+2). — Program Press backward skip button four times. skip → memory recall → play Specify track 1 (5−4). — Program Track 1 | Track 2 | Track 3 | Track 4 | Track 5 | Track 6 | Track 7 ① ② ③ (Auto-return)	1 3 5 3 1 0:01 Flashes on and off. •Disc play begins from track 3. •To enter the same track number in succession, simply press the memory/recall button the same number of times as that track is to be played. For example, to enter tracks 3, 5, 5 and 1: Press three times. → memory recall → Press twice (3+2=5). → skip memory recall → memory recall → Press four times (5−4=1). → skip → memory recall Program Press twice. → play

Skip play (3-1, 3-2, 4-1, 4-2)

3. Track skip play

Procedure (During disc play or the pause mode.)	Function/Notes
3-1 Forward track skip **Example:** While listening to the third track, the forward skip button is pressed to advance to the beginning of the fourth track and then again to advance to the beginning of the fifth track. Track 1 | Track 2 | Track 3 | Track 4 | Track 5 | Track 6 | Track 7 Pressed here. Pressed again. (Auto-return)	**•The pickup skips the same number of tracks as the number of times the button is pressed.** •Watch the display to be sure the desired track has been located. •During program disc play, the pickup moves to the beginning of the next programmed track. •To skip directly from the third track to the beginning of the fifth track, press the forward skip button twice. •Holding down the skip button activates the quick skip mode. •When the forward skip button is pressed during the last track, the pickup will go to the beginning of the last track (unless the repeat function is on). Go out. Flashes on and off. 3 4 5 3 1 2:50 6 7 When disc play begins, track numbers that have been skipped go out and the number of the track being played flashes on and off. Changes to 5.
3-2 Backward track skip **Example:** While listening to the third track, the backward skip button is pressed to return to the beginning of that track and then again, to return to the beginning of the second track. Track 1 | Track 2 | Track 3 | Track 4 | Track 5 | Track 6 | Track 7 Pressed again. Pressed here. (Auto-return)	**•The pickup skips the same number of tracks as the number of times the button is pressed.** •Watch the display to be sure the desired track has been located. •During program disc play, the pickup moves to the beginning of the previous programmed track. •To return quickly to the beginning of track 2 when listening to track 4, quickly press the backward skip button three times. •Remember that for backward skip, the present track is included in the count. •Holding down the skip button activates the quick skip mode. 2 flashes on and off. Remains lit. 2 3 4 5 3 1 2:50 6 7 Changes to 2.

4. Index Skip Play

Note:

- Use the index skip play function while the index number display is flashing on and off. When this display stops flashing on and off (after about 15 seconds), index skip is no longer possible and the forward or backward skip button will activate the track skip function.
- Index skip is possible only when playing a disc that has indexes.
- Index numbers above 19 cannot be used for the index skip function.
- Index skip is possible only within the same track.
- If the index display shows the letter "F" instead of a number, pressing the forward or backward skip button will activate the track skip function.

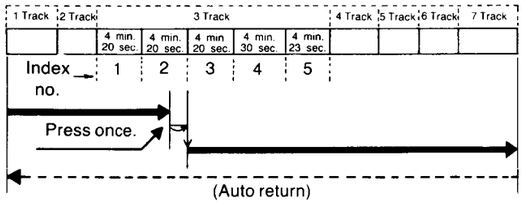
Procedure (During disc play or the pause mode.)	Function/Notes

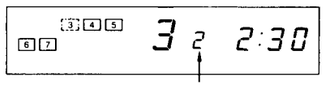
4-1 Forward index skip

Example: To skip ahead from index 2 to index 3 while listening to index 2 of track 3.

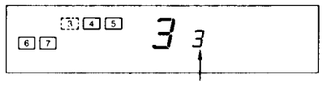
1 index ▭ **Press.**

2 ⏭ skip **Press once.**





The index number. "2" flashes on and off.



The index number. "3" remains illuminated.

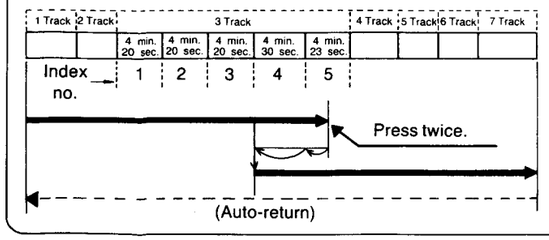
- The pickup advances to the beginning of index 3.

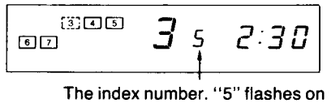
4-2 Backward index skip

Example: To skip back from index 5 to index 4 while listening to index 5.

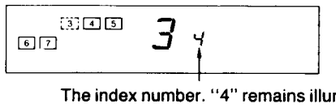
1 index ▭ **Press.**

2 ⏮ skip **Press twice.**





The index number. "5" flashes on and off.

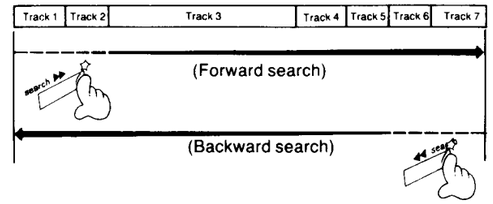


The index number. "4" remains illuminated.

- The pickup returns to the beginning of index 4.

Note:
In the backward skip mode, the current index is counted as the first index. Therefore, the backward skip button must be pressed twice to return to the previous index.

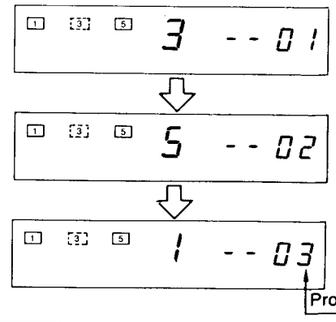
5. Manual search play

Procedure (During disc play or the pause mode.)	Function/Notes
■ To play the disc from a specific point • Press the forward or backward search button to move the pickup forward or backward. The pickup moves slowly at first and then rapidly if a search button is held down for more than about 3 seconds. • Release the button when the desired point has been reached (as shown by the display).	• If a search button is pressed while a disc is being played, sound from the disc can be heard as the pickup moves. The output level at this time is decreased by 12 dB (¼) compared with the normal level.  • During program disc play, the pickup can only be moved between the beginning and end of the track currently being played.

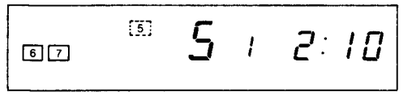
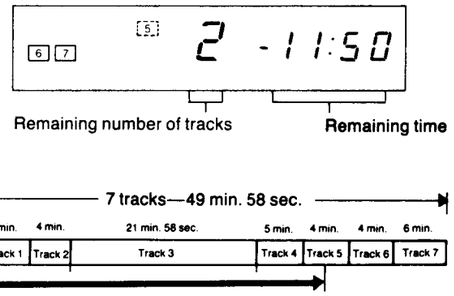
6. Repeat play

Procedure	Function/Notes
■ Entire disc and programmed track repeat play • Press the repeat button before beginning disc play. • Press the repeat button again to cancel repeat play.	• Repeat indicator illuminates to show that the repeat mode has been activated. • Indicator goes out. • If the unit is in the program disc play mode, only the programmed tracks will be played repeatedly. • Pressing the stop/clear button also cancels the repeat mode, but this also cancels all other functions.

7. Programmed track display function

Procedure	Function/Notes
■ To check programmed track numbers memory ▭ recall **Press.** **For example,** the display advances as shown on the right each time the recall button is pressed for a program of track 3, track 5 and track 1.	For example, when tracks 3,5 and 1 are programmed in that order, the display advances through the following three steps when the memory/recall button is pressed while playing track 3. 

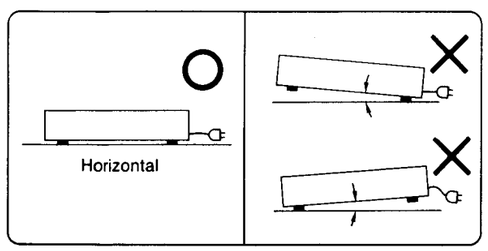
8. Remaining time display function

Procedure (During program play, the display will not switch to the remaining time display mode.)	Function/Notes
■ Example: To check the remaining time on a disc when the 2 min. 10 sec. point of index 1 of track 5 is being played.	
	
rem time **Press.**	•The time display switches to the remaining time mode.
To return to the elapsed time display, press the remaining time button once more.	 2 -11:50 Remaining number of tracks Remaining time 7 tracks—49 min. 58 sec. 5 min. 4 min. 21 min. 58 sec. 5 min. 4 min. 4 min. 6 min. Track 1 Track 2 Track 3 Track 4 Track 5 Track 6 Track 7
	When the remaining time button is pressed at the 2 min. 10 sec. point of track 5. 49 min. 58 sec.−38 min. 08 sec.=11 min. 50 sec.

■ INSTALLATION

■ This unit incorporates many sensitive optical components. To enjoy optimum performance at all times, avoid using this unit under the following conditions.

•Be particularly careful that the front of the player is not slanted downward. In this case, even an angle of merely 5 degrees could cause the player to malfunction.



•In a closed vehicle or other location where the temperature could exceed 100°F (40°C).

•For long periods of time in direct sunlight.
•Very cold places (below 40°F; 5°C).
•Very humid locations.
•Near a heat outlet or heating appliance.
•Dusty or smoky locations.
•Locations prone to vibrations.
•On an unstable or uneven surface.
•Near appliances generating strong magnetic fields.
•Within reach of children.
•In locations where the rear panel is less than 10 cm (about 4") away from the wall or back of an audio rack.

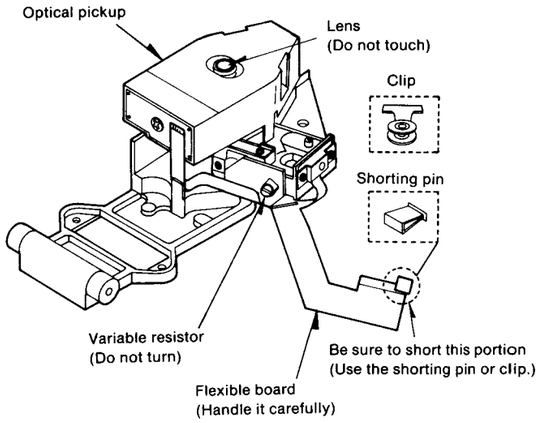
■ Do not place near a tuner or television.
This unit uses high frequency signals and can cause interference with radio and television reception. If this occurs, move this unit farther away from the radio or television or change from an interior to an exterior television antenna.

■ HANDLING PRECAUTIONS FOR OPTICAL PICKUP

The laser diode in the optical pickup may break down due to potential difference caused by static electricity of clothes or human body.
So, be careful of electrostatic breakdown during repair of the optical pickup.

• Handling of optical pickup

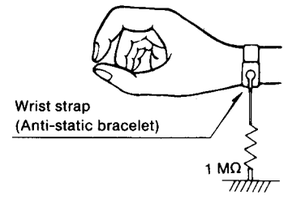
1. Do not give excessive shock to the optical pickup because it is of extremely precise structure.
2. To prevent the breakdown of the laser diode, an anti-static shorting pin is inserted into the flexible board. When removing or connecting the short pin, finish the job in as short a time as possible.
3. Take care not to apply excessive stress to the flexible board.
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

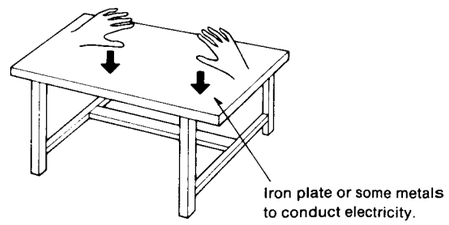


• Grounding for electrostatic breakdown prevention

1. Human body grounding
   Use the anti-static wrist strap to relieve the static electricity from your body.
2. Work table grounding
   Put a conductive material (sheet) or steel sheet on the area where the optical pickup is placed, and ground the sheet.

Caution:
The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the optical pickup.

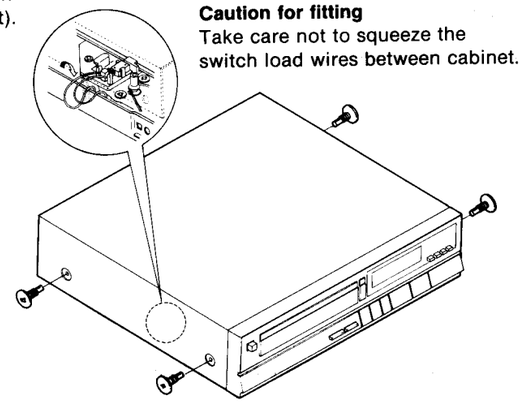




■ DISASSEMBLY INSTRUCTIONS

CAUTION:
- It is very dangerous to look at or touch laser radiation. (Laser radiation is invisible.)
- With the unit turned "on", laser radiation is emitted from the pickup lens.
- When doing the job, removing the cabinet and disc clamper of this unit, be sure to turn the power supply off.

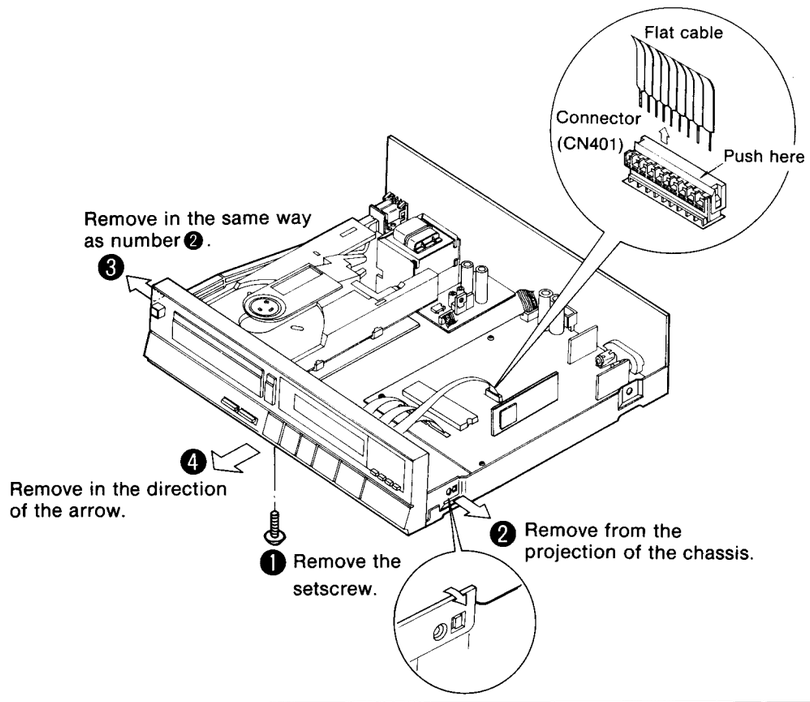
Ref. No 1	How to remove the cabinet
Procedure 1	• Remove the 4 setscrews (two each on the right and left sides of the cabinet).



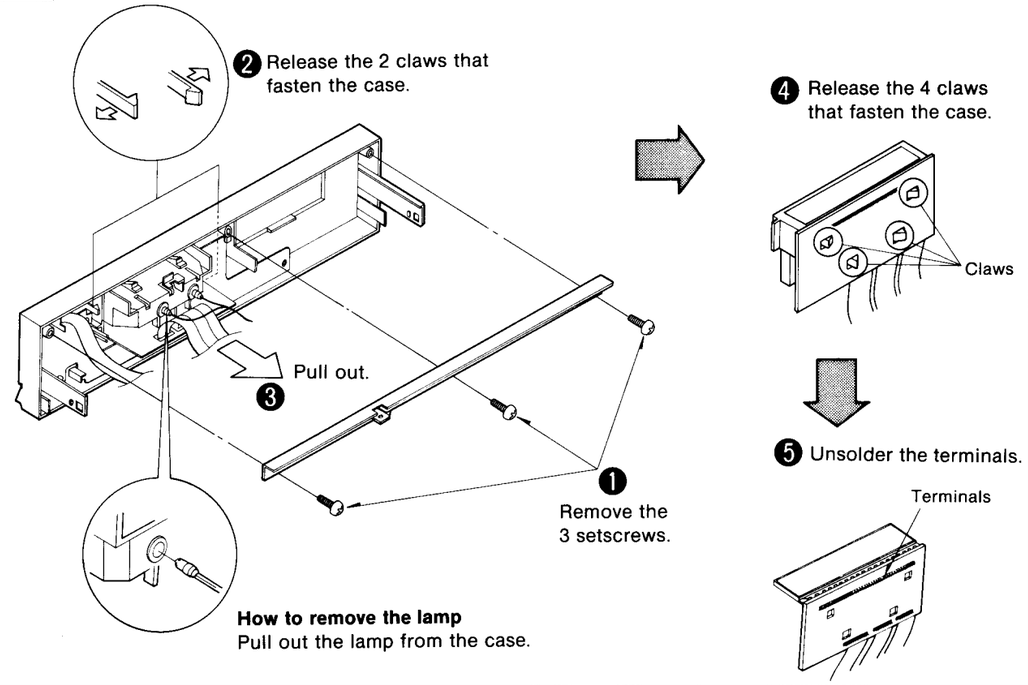
Caution for fitting
Take care not to squeeze the switch load wires between cabinet.

Ref. No 2	How to remove the front panel
Procedure 1 ➧ 2	• Remove in the numerical order shown.

Note: How to remove the flat cable
Pull out the flat cable while pressing the connector.



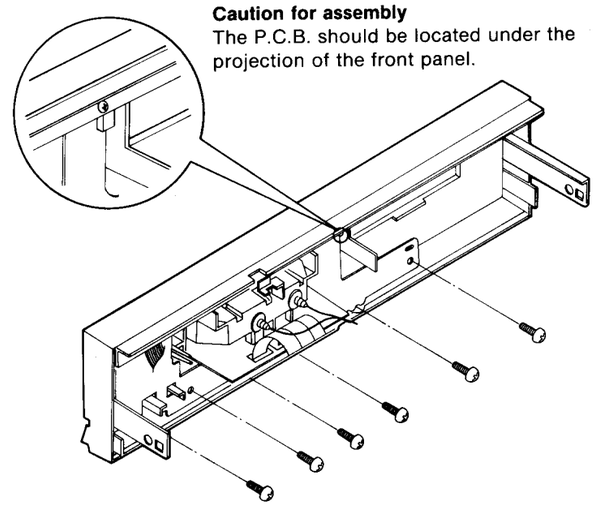
Ref. No 3	How to remove the liquid crystal display
Procedure 1 ➧ 2 ➧ 3	• Remove in the numerical order shown.


❷ Release the 2 claws that fasten the case.
❹ Release the 4 claws that fasten the case.
Claws
Pull out.
❸
❶ Remove the 3 setscrews.
❺ Unsolder the terminals.
Terminals

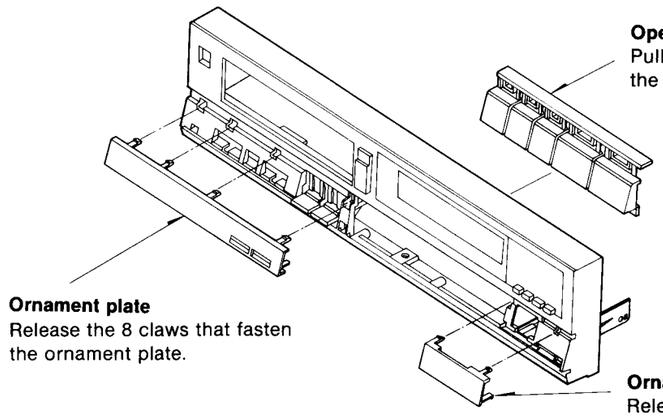
How to remove the lamp
Pull out the lamp from the case.

Ref. No 4	How to remove the keyboard P.C.B.
Procedure 1 ➧ 2 ➧ 4	• Remove the 6 setscrews.

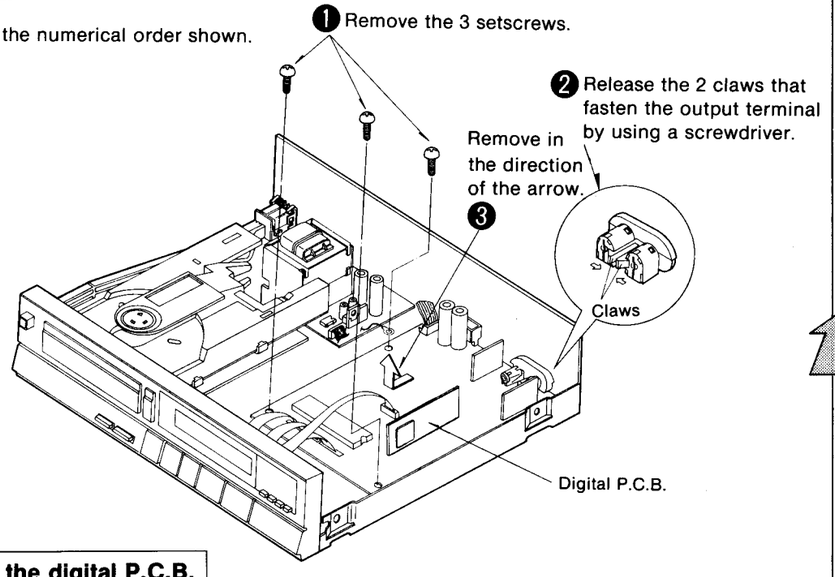
Caution for assembly
The P.C.B. should be located under the projection of the front panel.



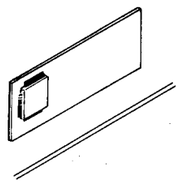
Ref. No 5	How to remove the operation button and ornament plate
Procedure 4 ➧ 5	


Operation button
Pull out the button from the front panel.
Ornament plate
Release the 8 claws that fasten the ornament plate.
Ornament plate
Release the 4 claws that fasten the ornament plate.

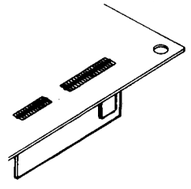
Ref. No 6	How to remove the main P.C.B.
Procedure 1 ➧ 6	• Remove in the numerical order shown.


❶ Remove the 3 setscrews.
❷ Release the 2 claws that fasten the output terminal by using a screwdriver.
Remove in the direction of the arrow.
❸
Claws
Digital P.C.B.

How to remove the digital P.C.B.



1. Remove the main P.C.B. and turn it over.
2. Remove the solder of the digital P.C.B. by using a solder sucker.



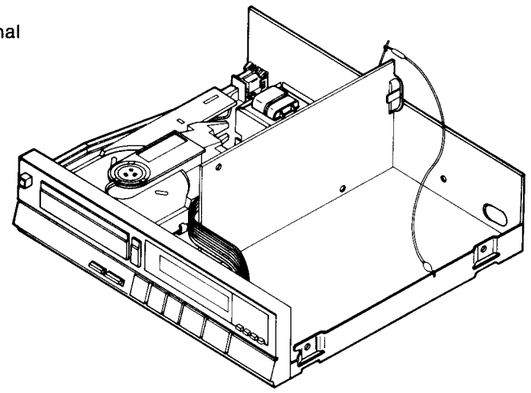
(Bottom view of P.C.B.)

How to check the main P.C.B.

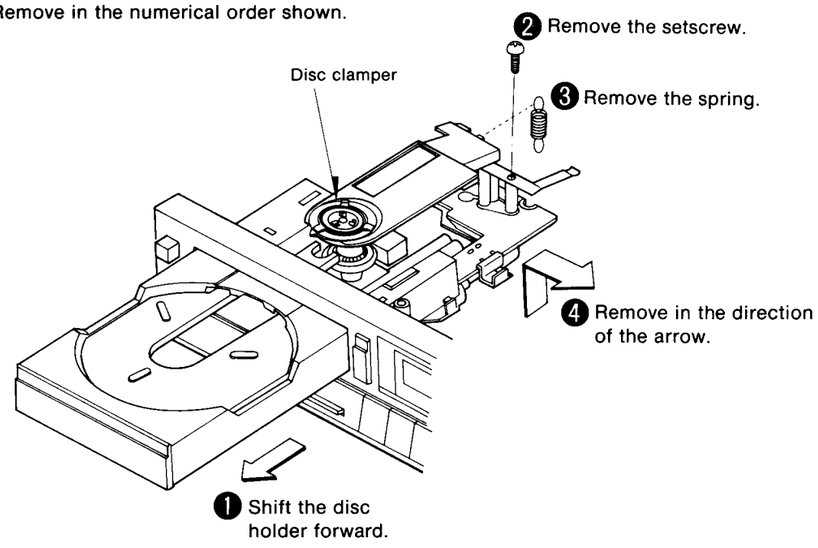
- When checking the soldered surfaces of the main P.C.B. and replacing the parts, do as shown below.

Cautions:

1. Be sure to connect the P.C.B. ground terminal (spring) and chassis lead wire.
2. Be sure to connect the power supply P.C.B. ground terminal and chassis lead wire.

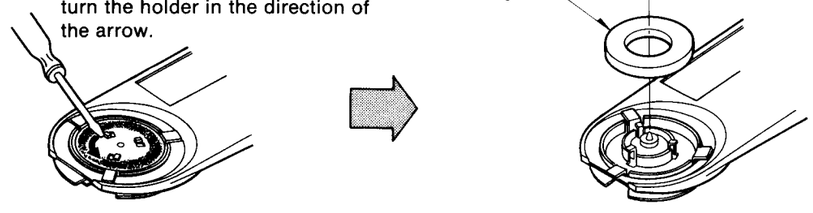


Ref. No 7	How to remove the disc clamper
Procedure 1 ➧ 7	• Remove in the numerical order shown.


❷ Remove the setscrew.
Disc clamper
❸ Remove the spring.
❹ Remove in the direction of the arrow.
❶ Shift the disc holder forward.

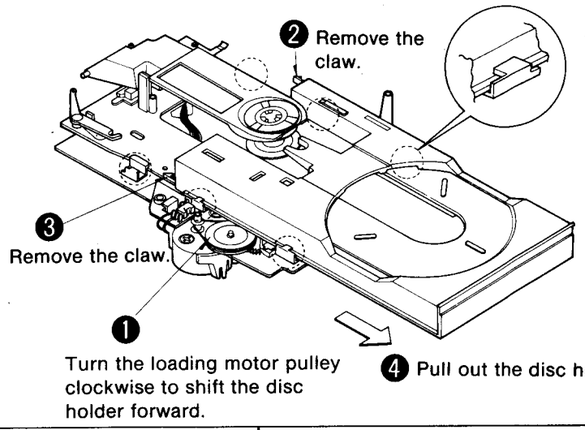
How to remove the magnet

- Insert a screwdriver between the magnet holder and clamper, then turn the holder in the direction of the arrow.

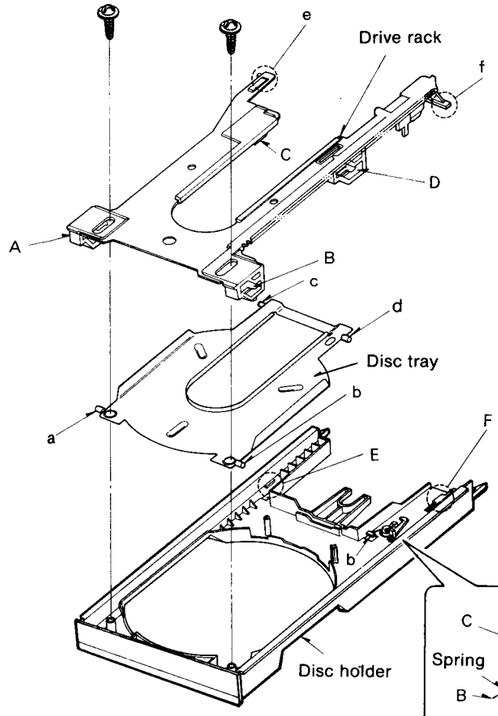


Ref. No 8	How to remove the disc holder
Procedure 1 ➧ 8	• Remove in the numerical shown.

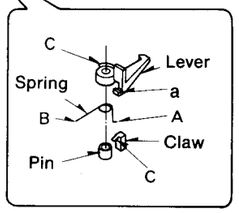
Caution for fitting
The disc holder should be fitted in the groove of loading base of 6 portions.


2 Remove the claw.
3 Remove the claw.
1 Turn the loading motor pulley clockwise to shift the disc holder forward.
4 Pull out the disc holder.

Ref. No 9	How to remove the disc tray and drive rack
Procedure 1 ➧ 8 ➧ 9	• Remove the 2 setscrews.



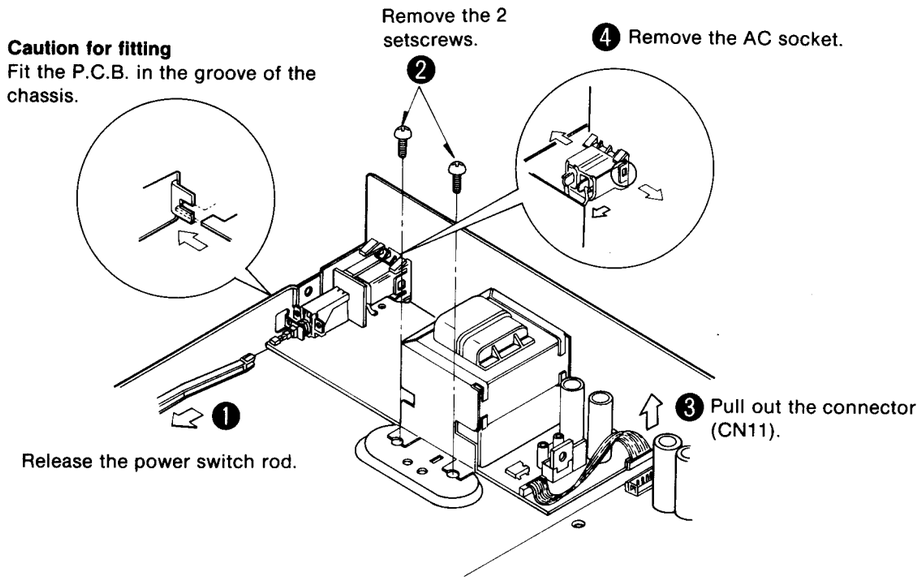
Caution for fitting
- The a ~ d of the disc tray should be set in grooves A ~ D of the drive rack.
- The e and f of the drive rack should be set in E and F of the disc holder.



Fitting of swing lever and spring
- Insert the spring into the pin, and fit the swing lever, matching part C of the swing lever with claw C.
- Match spring A to a and B to b.

Ref. No 10	How to remove the power supply P.C.B.
Procedure 1 ➧ 10	• Shift the disc holder forward, and remove in the numerical order shown.

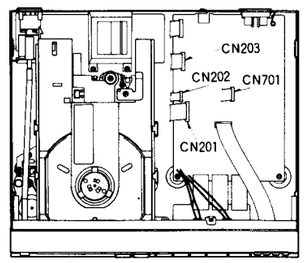
Caution for fitting
Fit the P.C.B. in the groove of the chassis.



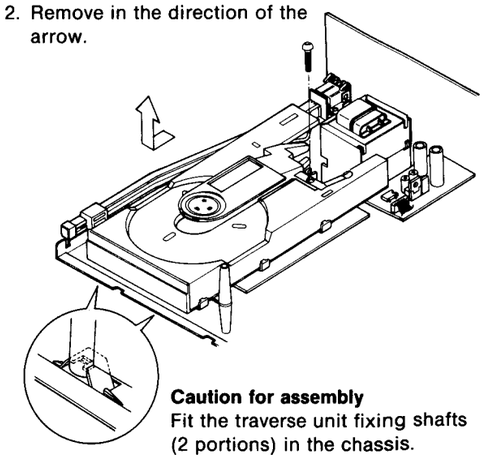
Ref. No 11	How to remove the traverse unit ass'y (optical deck unit)
Procedure 1 ➧ 2 ➧ 11	

Note: Push in the lock shaft at the bottom of the unit.
(See page 3.)

- Pull out the 4 connectors.
(CN201 ~ CN203 and CN701)



1. Remove the setscrew.
2. Remove in the direction of the arrow.

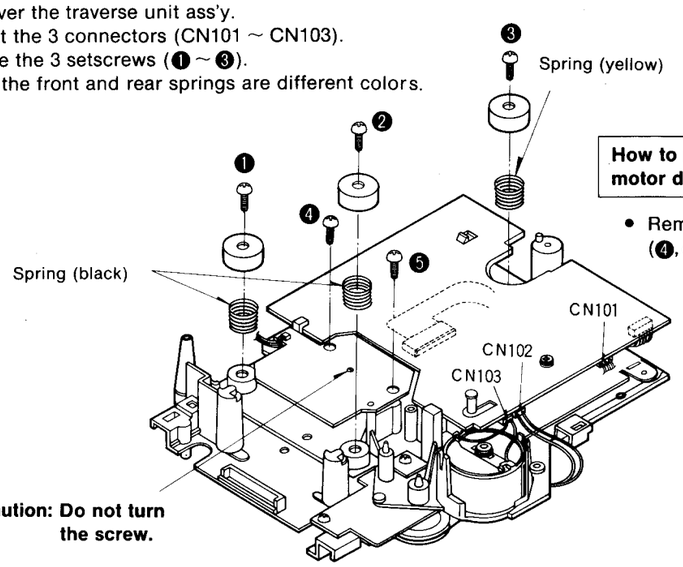


Caution for assembly
Fit the traverse unit fixing shafts (2 portions) in the chassis.

How to separate the traverse unit and disc holder

1. Turn over the traverse unit ass'y.
2. Pull out the 3 connectors (CN101 ~ CN103).
3. Remove the 3 setscrews (❶ ~ ❸).

Note that the front and rear springs are different colors.



How to remove the spindle motor drive P.C.B.

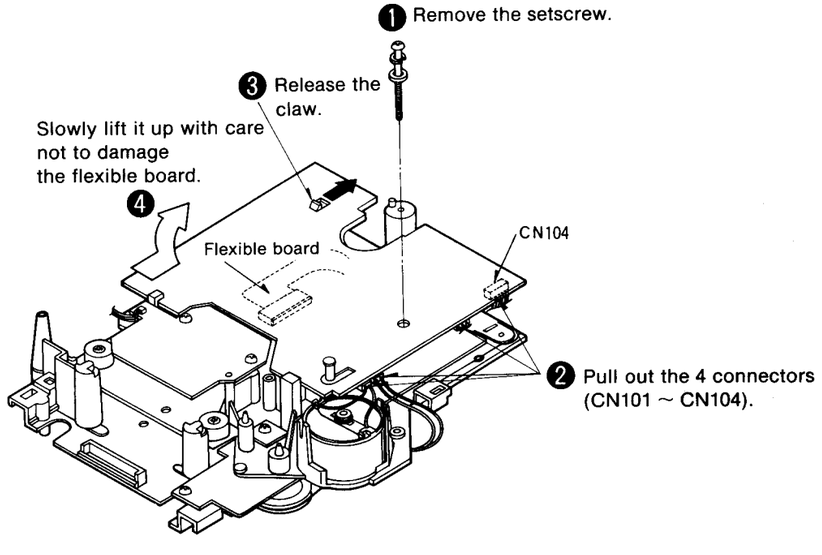
- Remove the 2 setscrews (❹, ❺).

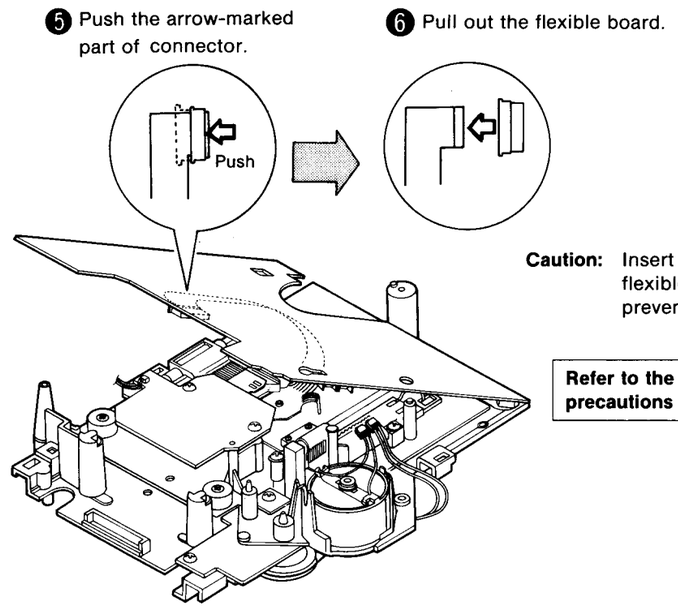
Ref. No 12	How to remove the optical servo P.C.B.
Procedure 11 ➧ 12	

Refer to the optical pickup handling precautions (see page 16).

- Turn over the traverse unit ass'y and remove in the numerical order shown.

Cautons:
- When repairing with the optical servo P.C.B. opened, take special care not to cut off the flexible board of the optical pickup.
- When the flexible board is removed, insert the short pin into the board.


❶ Remove the setscrew.
❸ Release the claw.
Slowly lift it up with care not to damage the flexible board.
❹
Flexible board
CN104
❷ Pull out the 4 connectors (CN101 ~ CN104).



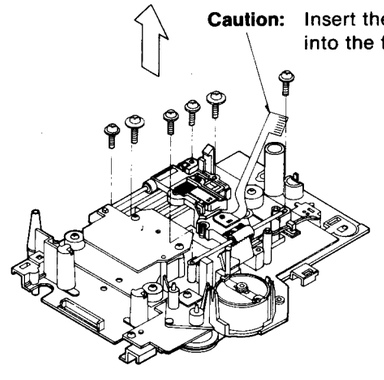
Caution: Insert the short pin into the flexible board in order to prevent breakdown of laser diode.

Refer to the optical pickup handling precautions (see page 16).

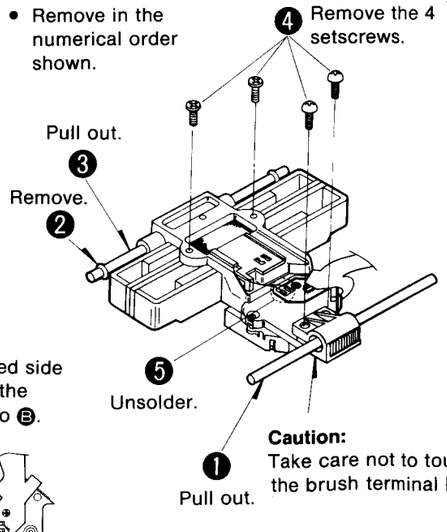
Ref. No 13	How to remove the optical pickup
Procedure 11 ➧ 12 ➧ 13	

- Remove the 6 setscrews.

Refer to the optical pickup handling precautions (see page 16).

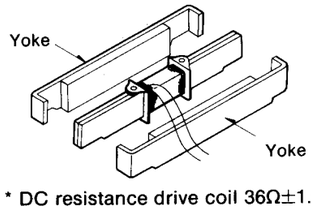


- Remove in the numerical order shown.



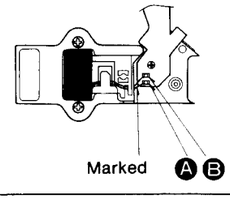
How to remove the drive coil

1. Remove the 2 yokes.
2. Pull out the drive coil.

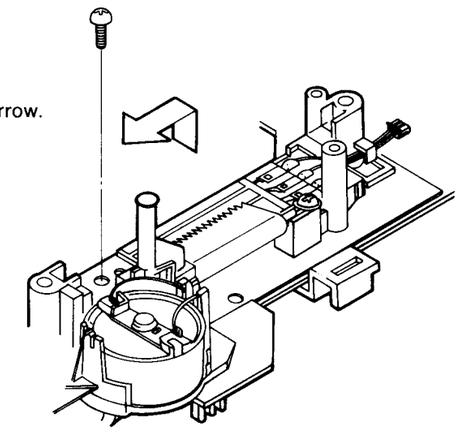


* DC resistance drive coil 36Ω±1.5Ω.

- **Drive coil fitting**
  Solder the marked side of coil to Ⓐ and the unmarked side to Ⓑ.



Ref. No 14	How to remove the resistance unit (optical pickup speed detection)
Procedure 10 ➧ 14	1. Remove the setscrew. 2. Remove in the direction of the arrow.



■ RESISTORS AND CAPACITORS

Notes: 1. Part numbers are indicated on most mechanical parts. Please use this part number for parts orders.
2. Important safety notice: Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components use only manufacturer's specified parts.
3. Unless otherwise specified. All resistors are in OHMS (Ω) K=1000Ω, M=1000kΩ All capacitors are in MICROFARADS (μF) P=10^{-6}μF.

Numbering System of Resistor

Example

ERD	S2	T	J	101	
Type	Wattage (1/4W)	Shape	Tolerance (±5%)	Value (100Ω)	
ERJ	8	GEY	J	102	
Type	Wattage (1/8W)	Shape	Tolerance (±5%)	Value (1kΩ)	Special use

Resistor Type	Wattage	Tolerance
ERD : Carbon	S2 : 1/4 W	J : ±5%
ERJ : Chip Type Carbon	8 : 1/8 W	K : ±10%

Numbering System of Capacitor

Example

ECKD	1H	102	K	C	
Type	Voltage (50V)	Value (0.001μF)	Tolerance (±10%)	Peculiarity	
ECEA	0J	KS	470	L	
Type	Voltage (6.3V)	Peculiarity Use	Value (47μF)	Special Use	
GR426	B	273	K	25	
Type	Peculiarity	Value (0.027μF)	Tolerance (±10%)	Voltage (25V)	

Capacitor Type	Voltage	Tolerance
ECEA : Electrolytic REC : Electrolytic (for audio) ECEA...N : Non-Polar Electrolytic RBP...N : Non-Polar Electrolytic (for audio) ECEV : Chip Type Non-Polar Electrolytic ECFR : Ceramic ECKD : Ceramic GR426 : Chip Type Ceramic ECQM : Polyester RCBS : Ceramic (axial)	ECEA, ECEV, REC and RBP Type 0G : 4V 0J : 6.3V 1A : 10V 1C : 16V 1E : 25V 1V : 35V 1H : 50V Others 1C : 16V DC 1E : 25V DC 1H : 50V DC 25 : 25V DC 50 : 50V DC KC : 125V AC	F : ±1pF J : ±5% K : ±10% M: ±20% N: ±30% Z : +80%, −20% P : +100%, −0%

Ref. No.	Part No.	Value
RESISTORS		
R11, 12	ERDS2TJ102	1K
R13, 14	ERDS2TJ222	2.2K
R15, 16	ERDS2TJ181	180
R101, 102	ERDS2TJ821	820
R103	ERDS2TJ154	150K
R104, 105	ERDS2TJ104	100K
R106	ERDS2TJ154	150K
R107	ERDS2TJ101	100
R108	ERDS2TJ474	470K
R109	ERDS2TJ222	2.2K
R110	ERDS2TJ564	560K
R111	ERDS2TJ472	4.7K
R112	ERDS2TJ333	33K
R113	ERDS2TJ104	100K
R114	ERDS2TJ474	470K
R115	ERDS2TJ101	100
R116	ERDS2TJ332	3.3K
R117	ERDS2TJ564	560K
R119	ERDS2TJ222	2.2K
R120	ERDS2TJ101	100
R121	ERDS2TJ392	3.9K
R122	ERDS2TJ270	27
R123	ERDS2TJ3R3	3.3
R124	ERDS2TJ224	220K
R125	ERDS2TJ333	33K
R126	ERDS2TJ182	1.8K
R127	ERDS2TJ333	33K
R128	ERDS2TJ122	1.2K
R129	ERDS2TJ103	10K
R131	ERDS2TJ472	4.7K
R132	ERDS2TJ103	10K
R133	ERDS2TJ153	15K
R134	ERDS2TJ101	100
R135	ERDS2TJ270	27
R136	ERDS2TJ3R3	3.3
R137	ERDS2TJ272	2.7K
R138, 139	ERDS2TJ333	33K
R140	ERDS2TJ122	1.2K
R141	ERDS2TJ153	15K
R142	ERDS2TJ272	2.7K
R143	ERDS2TJ683	68K
R144	ERDS2TJ473	47K
R145	ERDS2TJ154	150K
R146, 147	ERDS2TJ222	2.2K
R148	ERDS2TJ223	22K
R149	ERDS2TJ334	330K
R150	ERDS2TJ822	8.2K
R151, 152	ERDS2TJ682	6.8K
R153	ERDS2TJ822	8.2K
R154, 155	ERDS2TJ222	2.2K
R156, 157	ERDS2TJ102	1K
R158	ERDS2TJ471	470
R159	ERDS2TJ120	12
R160	ERDS2TJ153	15K
R161	ERDS2TJ272	2.7K
R162	ERDS2TJ102	1K
R163	ERDS2TJ104	100K
R201, 202	ERDS2TJ103	10K
R203, 204	ERDS2TJ333	33K
R205, 206	ERDS2TJ683	68K
R207	ERDS2TJ473	47K
R208	ERDS2TJ104	100K
R301	ERDS2TJ224	220K
R302	ERDS2TJ333	33K
R303	ERDS2TJ221	220
R304	ERDS2TJ562	5.6K
R305	ERDS2TJ474	470K
R306	ERDS2TJ824	820K
R401, 402	ERDS2TJ222	2.2K
R403	ERDS2TJ222	2.2K
R404	ERDS2TJ473	47K
R405, 406	ERDS2TJ472	4.7K
R407, 408	ERDS2TJ472	4.7K
R409	ERDS2TJ472	4.7K
R410	ERDS2TJ105	1M
R501	ERJ8GEYJ1R5V	1.5
R502	ERJ8GEYJ223V	22K
R503, 504	ERJ8GEYJ560V	56
R505	ERJ8GEYJ473V	47K
R701	ERDS2TJ103	10K
R702	ERDS2TJ123	12K
R703	ERDS2TJ102	1K
R704, 705	ERDS2TJ471	470
R706	ERDS2TJ224	220K
R707	ERDS2TJ154	150K
R708	ERDS2TJ472	4.7K
R709	ERDS2TJ561	560
R710, 711	ERDS2TJ472	4.7K
R712, 713	ERDS2TJ472	4.7K
R714	ERDS2TJ472	4.7K
R715	ERDS2TJ222	2.2K
R801, 802	ERDS2TJ332	3.3K
R803, 804	ERDS2TJ391	390
R805, 806	ERDS2TJ473	47K
R807	ERDS2TJ103	10K
R808	ERDS2TJ472	4.7K

Ref. No.	Part No.	Value
CAPACITORS		
C1	⚠ ECKDKC103PF	0.01
C4, 5	ECEA1VU102	1000
C6, 7	ECEA1CU470	47
C11, 12	ECEA1CU470	47
C13	ECEA0JU102	1000
C14	ECEA0JU101	100
C15	ECEA0JU4R7	4.7
C16, 17	ECEA1CU222	2200
C18	ECEA0JU470	47
C19	ECEA1EU471	470
C20	ECKD1H103ZF	0.01
Except for [M, MC]		
C101, 102	ECEA1CKS100	10
C103	RCBS1C103MYY	0.01
C104	ECQM1H104JZ	0.1
C105	RCBS1H221KBY	220P
C106	ECEA1HSN010	1
C108	ECEA1HSN2R2	2.2
C109	ECEA1HSN0R1	0.1
C110	ECQM1H123JZ	0.012
C111	ECQM1H152JZ	0.0015
C112	ECQM1H223JZ	0.022
C114	ECEA1HSN010	1
C115	ECEA1HSNR22	0.22
C116	ECQM1H123JZ	0.012
C117	RCBS1H681KBY	680P
C118	ECQM1H103JZ	0.01
C119	RCBS1C103MYY	0.01
C120, 121	RCBS1H102KBY	0.001
C122	RCBS1H681KBY	680P
C123, 124	RCBS1H102KBY	0.001
C125	ECEA1HKS0R1	0.1
C126	RCBS1H220JLY	22P
C127	ECEA1HKS010	1
C128	ECFF1H104ZF	0.1
C129, 130	ECEA1CKS100	10
C133	RCBS1H681KBY	680P
C134	ECEA0JKS220	22
C135	ECEA1HKS010	1
C136	RCBS1H221KBY	220P
C137	ECQM1H333JZ	0.033
C138	RCBS1C682MXY	0.0068
C139	RCBS1H182MXY	0.0018
C140	ECEA1HKSR33	0.33
C141	ECEA0JKS470	47
C142, 143	ECEA0JKS220	22
C144	RCBS1C103MYY	0.01
C145	ECEA0JKS220	22
C146	ECQM1H104JZ	0.1
C147	RCBS1C103MYY	0.01
C148	ECKD1H102KB	0.001
C301	RCBS1H150JRY	15P
C302	ECEA1VKN2R2	2.2
C303	ECQM1H153JZ	0.015
C304	ECQM1H154JZ	0.15
C305	ECQM1H104JZ	0.1
C306	RCBS1H102KBY	0.001
C307	ECEA1HKSR47	0.47
C308	ECQM1H333JZ	0.033
C309	RCBS1H102KBY	0.001
C310	ECQM1H104JZ	0.1
C312	RCBS1H6R8KCY	6.8P
C313	RCBS1H220JLY	22P
C314	ECEA1CKS100	10
C315	RCBS1C103MYY	0.01
C317, 318	RCBS1C103MYY	0.01
C319	RCBS1C103MYY	0.01
C320, 321	RCBS1H681KBY	680P
C401	ECFR1H104ZFM	0.1
C402	ECKD1H102KB	0.001
C403	ECFR1H104ZFM	0.1
C404	ECKD1H103ZF	0.01
C405	ECKD1H102KB	0.001
C501	ECEV1EV6R8R	6.8
C502	GR426B273K25	0.027
C503, 504	ECEV1CN4R7R	4.7
C505	GR426B104M25	0.1
C506	GR426F334Z25	0.33
C507	GR426F224Z25	0.22
C508, 509	GR426F104Z25	0.1
C510	GR426F104Z25	0.1
C701	ECEA0JU470	47
C702	ECQM1H333JZ	0.033
C801, 802	REC1C470T	47
C803, 804	ECQM1H103JZ	0.01
C805, 806	RBP1CN220CT	22
C807	ECFR1H104ZFM	0.1
C809	ECEA1CU470	47

■ Indication of RCBS type capacitor (Axial type)

• Rated voltage

The rated voltages are indicated by insulator paint colors.

Rated voltage (DC)	Paint color
16V	Pink
50V	Light-green

• Electrostatic capacity and characteristics

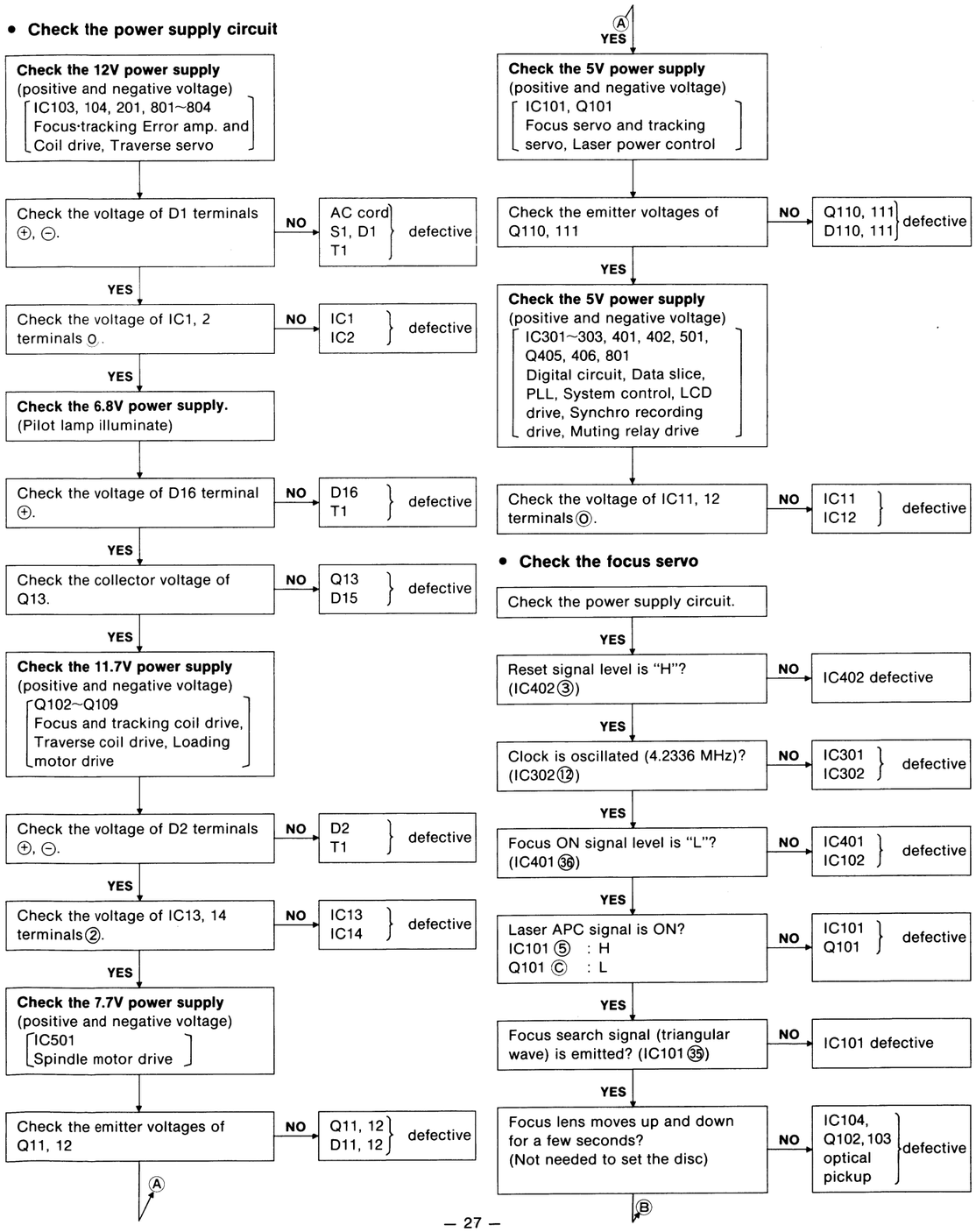
The nominal electrostatic capacites (PF), tolerances and temperature characteristics are indicated by color codes.

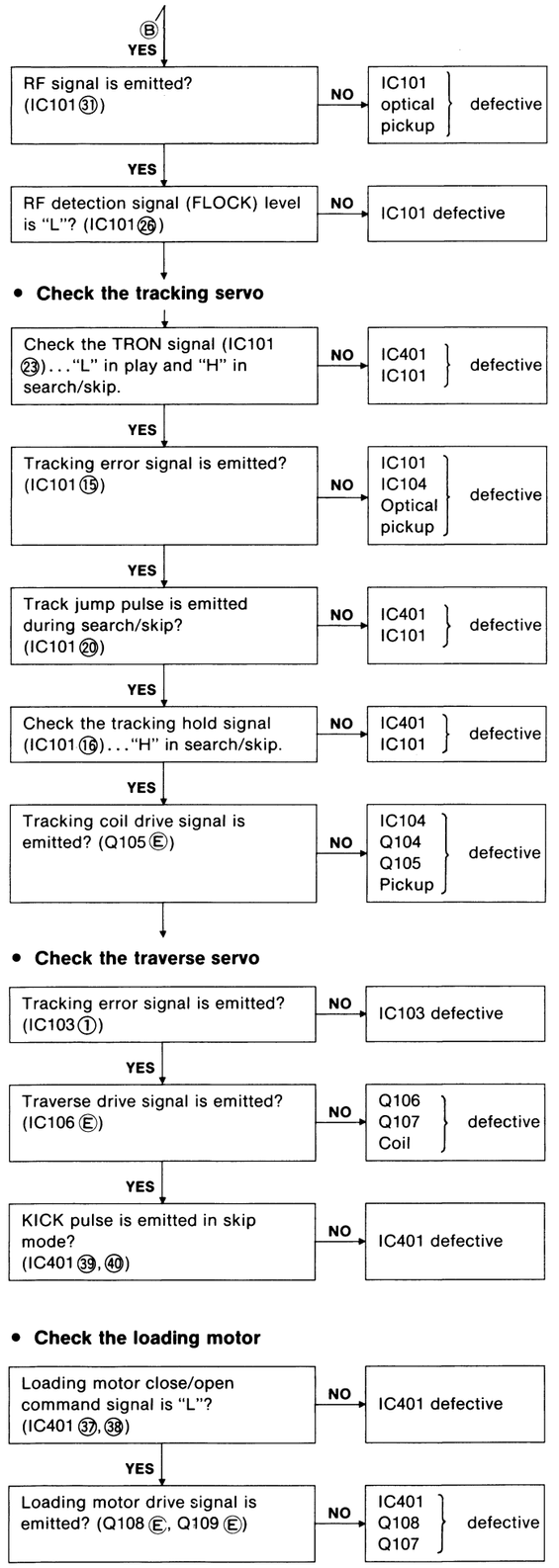
Color band	Brown	Red	Orange	Yellow	Green	Blue	Purple	Gray	White	Black	Gold	Silver
1st, 2nd color bands (Effective number of nominal electrostatic capacity)	1	2	3	4	5	6	7	8	9	0	—	—
3rd color band (Multiplier of nominal electrostatic capacity)	10^1	10^2	10^3	10^4	—	—	—	—	—	10^0	10^{-1}	10^{-2}
4th color band (Tolerances)	—	—	—	—	—	—	—	N	Z	M	J	K
5th color band (Temperature characteristic)												

■ TROUBLESHOOTING

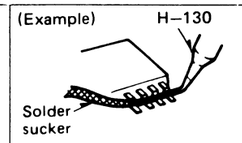
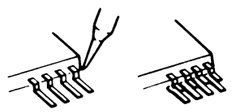
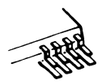
Notes:
1. Carefully handle the compact disc because stain, dust or warping may cause generation of noise.
2. For the voltage value and waveform, refer to the schematic diagram. (The voltage value and waveform slightly varies depending on the measuring set and tester.)
3. Possible defects are mainly shown by the name of semi-conductor. The adjacent electronic circuits (such as C and R) are omitted.

- **Check the power supply circuit**


Check the 12V power supply (positive and negative voltage) [IC103, 104, 201, 801~804 Focus·tracking Error amp. and Coil drive, Traverse servo]
Check the voltage of D1 terminals ⊕, ⊖.
NO → AC cord, S1, D1, T1 } defective
YES
Check the voltage of IC1, 2 terminals ⓞ.
NO → IC1, IC2 } defective
YES
Check the 6.8V power supply. (Pilot lamp illuminate)
Check the voltage of D16 terminal ⊕.
NO → D16, T1 } defective
YES
Check the collector voltage of Q13.
NO → Q13, D15 } defective
YES
Check the 11.7V power supply (positive and negative voltage) [Q102~Q109 Focus and tracking coil drive, Traverse coil drive, Loading motor drive]
Check the voltage of D2 terminals ⊕, ⊖.
NO → D2, T1 } defective
YES
Check the voltage of IC13, 14 terminals ②.
NO → IC13, IC14 } defective
YES
Check the 7.7V power supply (positive and negative voltage) [IC501 Spindle motor drive]
Check the emitter voltages of Q11, 12
NO → Q11, 12, D11, 12 } defective
Ⓐ
Ⓐ
YES
Check the 5V power supply (positive and negative voltage) [IC101, Q101 Focus servo and tracking servo, Laser power control]
Check the emitter voltages of Q110, 111
NO → Q110, 111, D110, 111 } defective
YES
Check the 5V power supply (positive and negative voltage) [IC301~303, 401, 402, 501, Q405, 406, 801 Digital circuit, Data slice, PLL, System control, LCD drive, Synchro recording drive, Muting relay drive]
Check the voltage of IC11, 12 terminals ⓞ.
NO → IC11, IC12 } defective
• Check the focus servo
Check the power supply circuit.
YES
Reset signal level is "H"? (IC402 ③)
NO → IC402 defective
YES
Clock is oscillated (4.2336 MHz)? (IC302 ⑫)
NO → IC301, IC302 } defective
YES
Focus ON signal level is "L"? (IC401 ㊱)
NO → IC401, IC102 } defective
YES
Laser APC signal is ON? IC101 ⑤ : H, Q101 Ⓒ : L
NO → IC101, Q101 } defective
YES
Focus search signal (triangular wave) is emitted? (IC101 ㉟)
NO → IC101 defective
YES
Focus lens moves up and down for a few seconds? (Not needed to set the disc)
NO → IC104, Q102, 103 optical pickup } defective
Ⓑ


Ⓑ
YES
RF signal is emitted? (IC101 ㉛)
NO → IC101 optical pickup } defective
YES
RF detection signal (FLOCK) level is "L"? (IC101 ㉖)
NO → IC101 defective
• Check the tracking servo
Check the TRON signal (IC101 ㉓)..."L" in play and "H" in search/skip.
NO → IC401, IC101 } defective
YES
Tracking error signal is emitted? (IC101 ⑮)
NO → IC101, IC104 Optical pickup } defective
YES
Track jump pulse is emitted during search/skip? (IC101 ⑳)
NO → IC401, IC101 } defective
YES
Check the tracking hold signal (IC101 ⑯)..."H" in search/skip.
NO → IC401, IC101 } defective
YES
Tracking coil drive signal is emitted? (Q105 Ⓔ)
NO → IC104, Q104, Q105, Pickup } defective
• Check the traverse servo
Tracking error signal is emitted? (IC103 ①)
NO → IC103 defective
YES
Traverse drive signal is emitted? (IC106 Ⓔ)
NO → Q106, Q107, Coil } defective
YES
KICK pulse is emitted in skip mode? (IC401 ㊴, ㊵)
NO → IC401 defective
• Check the loading motor
Loading motor close/open command signal is "L"? (IC401 ㊲, ㊳)
NO → IC401 defective
YES
Loading motor drive signal is emitted? (Q108 Ⓔ, Q109 Ⓔ)
NO → IC401, Q108, Q107 } defective
• Check the CLV servo
TRON signal level is at "L"? (IC302 ⑩)
NO → IC302, IC401 } defective
YES
SRF signal is emitted? (IC302 ㉕)
NO → IC101, IC301, IC302 } defective
YES
Spindle motor drive signal level is "L"? (IC302 ㊺)
NO → IC302 defective
YES
Spindle motor drive signal level is "H"? (Q701 Ⓒ)
NO → Q701, D701, IC501 } defective
YES
Spindle motor control signal level is "H"? (IC302 ㊹)
NO → IC302, IC501 } defective
YES
FG pulse is emitted? (IC302 ㊻)
NO → IC302, IC501 } defective
• Check the audio circuit
FRM, PCK signal emitted? (IC301 ③, ⑤)
NO → IC301, IC302 } defective
YES
16-bit data signal is emitted? (IC803 ②, ③, ⑤~⑱)
NO → IC302, IC303, IC803 } defective
YES
PAM signal is emitted? (IC803 ⑲)
NO → IC803 defective
YES
Deglitch signal is emitted? (IC302 ⑲, ⑳)
NO → IC302, IC801, IC802 } defective
YES
AF signal is emitted? (IC801, 802 ②)
NO → IC801, IC802, IC804 } defective
YES
Muting ON signal level is "L"? (IC401 ㉛)
NO → IC401 defective
YES
Relay terminal is open?
NO → Q801, RLY801 } defective

■ HOW TO REPLACE IC'S (Small outline type)

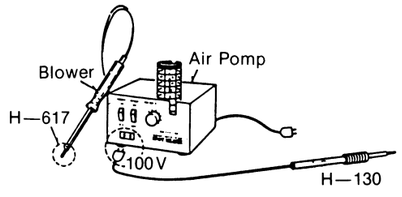
	Replacing procedure		Cautions
1	Reduce the amount of solder on each pin of the integrated circuit by use of a solder sucker.	(Example) H—130 	● **Recommended tool** .....Special soldering iron *H605M and H—130. *H605E and H—130. ● Do not touch the soldering iron to the area for a long time. It may otherwise cause removal of the print foil. ● When shifting the pin upward, do the job quickly while the solder is melting. If the solder is hard, it may cause removal or breakage of the print foil. ● When using a pencil type soldering iron. 1. Completely remove the solder from each IC pin by use of solder sucker. 2. Raise each pin by means of an eyeleteer, hold the pliers then remove IC package from P.C.B.
2	Melt the solder on the pin (one electrode) with the soldering iron.		
3	While the solder is melting, shift the pin upward by the soldering iron to remove it from the foil.		
4	Remove each pin from the foil according to the above-mentioned procedure.		

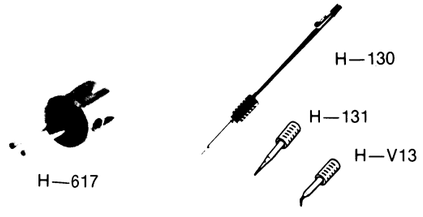
*** Special soldering iron**
(Refer to Technical Information, ORDER NO. GAD84125486T1)...For U.S.A. and Canada
(Refer to Technical Information, ORDER NO. GAD84115476T8)...For others

- **H—605 Spot Heater (hot-air solder iron)**

This device that uses hot air to melt solder was developed to remove Flat-Pakage ICs, RHCs and chip parts.

- H—605M (For 120V power source)
- H—605E (For 200V/220V/240V power source)





- **H—617 Twin Nozzle (for spot heater)**

Special nozzle for the removal of RHCs and chip resistors.
(Nozzle diameter : 1.0 mm x 2)

- **H—130 Slim Pencil Solder Iron**

An ultrasmall ceramic heater solder iron is extremely handy for soldering chip parts, RHCs, ICs, etc., to high-density circuit boards.
Features:

- Rated power: 100V, 15W
- Max. temp.: 400°C
- Heater: ceramic (long life)
- Insulation resistance: 100MΩ
- Length: 178 mm
- Weight: 16 g (not including cord)

- **H—131, H—V13 Cap Bits**

Solder tip for the slim pencil Solder Iron and is composed of a bit holder and a corrosion resistance solder tip.
Permits changing of solder tips even while still hot.

- Solder tip: 0.3 mm

■ TERMINAL FUNCTION OF LSI

- **MN6617 (Digital Signal Processing: EFM Decoder, Error Correction, CLV Servo)**

Pin No.	Mark	I/O Device	Function
1	BLKCK	O	Sub-code block (Q data) clock (75 Hz)
2	$\overline{\text{CLDCK}}$	O	Sub-code frame clock (7.35 kHz)
3	$\overline{\text{SUBQ}}$	O	Sub-code Q code output
4	CRC	O	Sub-code (Q data) CRC check (not used, open)
5	$\overline{\text{RST}}$	I	Reset signal input (reset at "L")
6	MLD	I	Command load input (load at "L")
7	MCLK	I	Command clock
8	MDATA	I	Command data input
9	DMUTE	I	Muting control (muting ON at "H")
10	$\overline{\text{TRON}}$	I	Tracking servo ON signal (tracking servo ON at "L")
11	STAT	O	Processing condition (CRC, OTC, CLVOK, TT STOP) output
12	SMCK	O	Clock output (4.2336 MHz)
13	PMCK	O	Pitch control clock output (not used, open)
14	ITC	I	Track counter input signal (not used, open)
15	$\overline{\text{TEST}}$	I	Test mode selection (not used, connected to +5V)
16	X2	O	Clock output (16.9344 MHz)
17	X1	I	Clock input (16.9344 MHz)
18	SEL	I	DA output parallel/serial selection (parallel at "H")
19	LDG	O	L channel deglitch signal
20	RDG	O	R channel deglitch signal
21	DEMPH	O	De-emphasis ON signal (de-emphasis ON at "H")
22	IPFLAG	O	Interpolation flag (interpolation at "H")
23	FLAG0	O	Error flag (error at "H")
24	FLAG6	O	16K RAM address reset signal (reset at "H")
25	XCK	O	Clock output (not used, open)
26 ≀ 30	DA15 ≀ DA11	O	16-bit data output (DA15: MSB)
31	GND	I	GND terminal
32 ≀ 42	DA10 ≀ DA0	O	16-bit data output (DA0: LSB)
43 ≀ 50	D7 ≀ D0	I/O	16K RAM data input/output
51	RAMOE	O	16K RAM $\overline{\text{OE}}$ signal
52	RAMWE	O	16K RAM $\overline{\text{WE}}$ signal
53 ≀ 63	RAMA0 ≀ RAMA10	O	16K RAM address signal (RAM0: LSB, RAM10: MSB)
64	PC	O	Spindle motor ON signal (spindle motor ON at "L")
65	EC	O	Spindle motor drive signal
66	FG	I	Spindle motor FG signal input
67	——	——	——
68	——	——	——
69	——	——	——
70	——	——	——
71	——	——	——
72	PCK	I	PLL extract clock input (4.3218 MHz)
73	VDD	I	Power supply (connected to +5V)
74	EFM	I	EFM signal input (PLL)
75	SRF	I	EFM signal input (DSL)
76	DO	I	Drop-out signal (drop-out at "H")
77	CLVS	O	11T Servo OK signal (11T Servo OK at "H")
78	FPC	O	PLL frequency comparison signal
79	BSSEL	O	PLL frequency in take operation signal
80	——	——	——
81	——	——	——
82	——	——	——
83	SUBC	O	Sub-code serial output data (not used, open)
84	SBCK	I	Clock for sub-code serial output (not used, open)

• AN8370S (Optical Servo Control)

Pin No.	Mark	I/O Device	Function
1	VEE	I	Power supply (connected to −5V)
2	LSA	I	Phase difference input (A)
3	GND	I	GND terminal
4	LSB	I	Phase difference input (B)
5	APC	O	Auto laser power control output
6	TEOUT	O	Tracking error signal output
7	TEG	I	Tracking error gain adjusting input
8	TE−	I	Phase difference-to-voltage conversion (−)
9	TE+	I	Phase difference-to-voltage conversion (+)
10	APC−	I	Laser power inversion input
11	C·MEM	I	Capacitor connection for phase difference memory
12	APC+	I	Laser power input
13	VREF	O	Reference current generation
14	SENSE	O	Selector output (track-crossed)
15	HIN	I	Tracking hold circuit input
16	HOUT	O	Tracking hold circuit output
17	SPCNT	O	Track-cross speed control output (not used, open)
18	C·MSP	I	Track-cross reference speed setting capacitor connection (not used, open)
19	C·AF	I	Auto focus timer capacitor connection
20	KICK R/F	O	Track kick signal output
21	VCC	I	Power supply (connected to +5V)

Pin No.	Mark	I/O Device	Function
22	CNT1	I	Control input ($\overline{\text{FOON}}$: Focus servo ON signal)
23	CNT2	I	Control input ($\overline{\text{TRON}}$: Tracking servo ON signal)
24	CNT3	I	Control input (KICKF: Kick direction [Forward] command)
25	CNT4	I	Control input (KICKR: Kick direction [Reverse] command)
26	$\overline{\text{F·LOCK}}$	O	Focus lock signal output
27	C·FBDO	O	Capacitor connection for inversion RF high speed detection
28	C·SBDO	O	Capacitor connection for inversion RF low speed detection
29	C·SBRT	O	Capacitor connection for non-inversion RF low speed detection
30	C·FBRT	O	Capacitor connection for non-inversion RF high speed detection
31	RF OUT	O	RF signal output
32	BDO	O	Drop-out detection output
33	RF IN	I	RF signal input
34	S·OUT	O	Focus search signal output
35	C·LW	I	Capacitor connection for triangular wave generation
36	FE·OUT	O	Focus error signal output
37	FEG	I	Focus error gain adjusting input
38	FE·REF	I	Focus error comparison voltage generation
39	PDB	I	Photo detector current input (B)
40	IVB	O	Current to voltage conversion (B)
41	IVA	O	Current to voltage conversion (A)
42	PDA	I	Photo detector current input (A)

• AN8371S (Data slice and PLL)

Pin No.	Mark	I/O Device	Function
1	VEE	I	Power supply (connected to −5V)
2	SRF	O	RF signal output data-sliced into digital value
3	EFM	O	EFM signal output synchronized with PCK
4	D·GND	I	GND terminal (digital system)
5	PCK	O	Clock output extracted from SRF
6	VCC	I	Power supply (connected to +5V)
7	VA	I	VCO free ran frequency adjusting current input
8	VC1	I	Capacitor connection for VCO oscillation frequency
9	VC2	I	Capacitor connection for VCO oscillation frequency
10	VR	I	Resistor connection for VCO oscillation frequency
11	PD	I	Capacitor connection for PLL DO protection
12	PL1	I	PLL loop filter constant connection

Pin No.	Mark	I/O Device	Function
13	PL2	I	PLL loop filter constant connection
14	FPC	I	Frequency comparison error signal input
15	RF	I	RF signal input
16	ARF	O	RF signal output with AGC applied
17	AGC	I	ARF signal input for AGC drop-out detection
18	AC	I	AGC loop filter constant connection
19	DO	O	Drop-out detection pulse output
20	A·GND	I	GND terminal (analog system)
21	DSL	I	RF signal input for data slicer
22	SLC	I	Slice level control signal input
23	FC1	I	Data slicer filter capacitor connection
24	FC2	I	Data slicer filter capacitor connection

• MN15845PDB (System Control and LCD Drive)

Pin No.	Mark	Signal	I/O Device	Function
1 ≀ 7	SEG17 ≀ SEG23	——	O	LCD segment line output
8	VSS	GND	I	GND terminal
9	VDD	VDD	I	Power supply (connected to +5V)
10	OSC1	OSC	I	Clock input
11	OSC2	——	O	Not used (open)
12	XI	TCNT	I	Track count input (track cross input in rough search)
13	XO	——	O	Not used (open)
14	$\overline{\text{RST}}$	$\overline{\text{RESET}}$	I	Reset signal input (reset at "L")
15	SYNC	——	O	Not used (open)
16	IRQ	BLKCK	I	Q data read-in timing strobe signal input
17	SIRQ	——	I	Not used (open)
18	SBI	$\overline{\text{SUBQ}}$	I	Q data read-in input (sub-code Q code)
19	SBO	——	O	Not used (open)
20	SBT	$\overline{\text{CLDCK}}$	I	Q data read-in data strobe signal input (sub-code frame clock: 7.35 kHz)
21 ≀ 24	P40 ≀ P43	——	I	Key scan input
25	P00	MCLK	I/O	Key input strobe and data clock output
26	P01	STAT	I/O	Key input strobe and processing status input from signal processing LSI
27	P02	——	O	Key input strobe
28	P03	——	O	Key input strobe

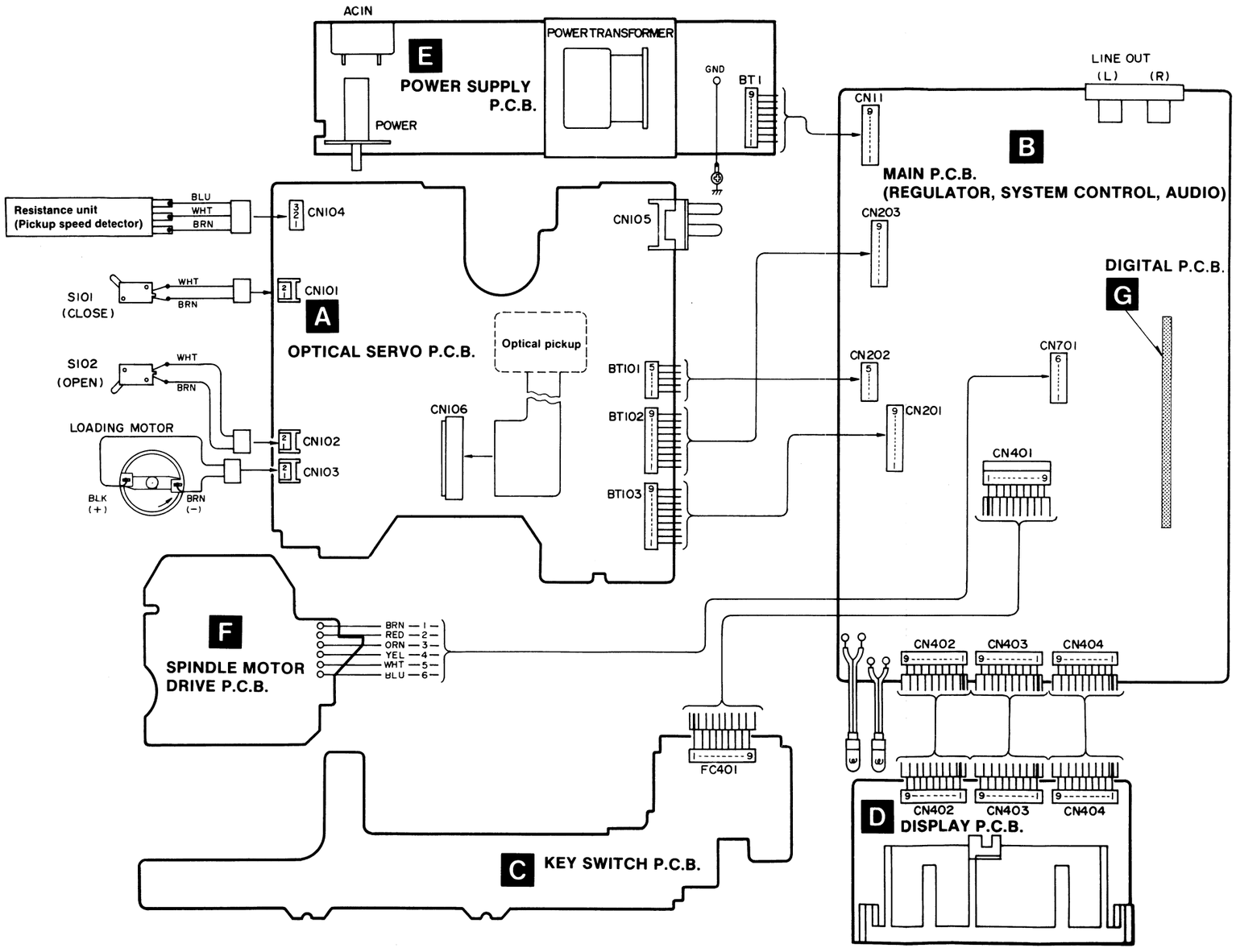
Pin No.	Mark	Signal	I/O Device	Function
29	P10	——	O	Key input strobe
30	P11	MLD	O	Data strobe signal output (signal processing LSI command load output)
31	P12	MUTE	O	Muting control (muting ON at "H")
32	P13	SYNC	O	Synchro recording control (recording ON at "L")
33	P20	CNT4	O	Optical servo IC control signal (KICKR: Kick direction [Reverse] command)
34	P21	CNT3	O	Optical servo IC control signal (KICKF: Kick direction [Forward] command)
35	P22	CNT2	O	Optical servo IC control signal (TRON: Tracking servo)
36	P23	CNT1	O	Optical servo IC control signal (TRON: Focus servo)
37	P30	$\overline{\text{CLOSE}}$	O	Loading motor close command (ON at "L")
38	P31	$\overline{\text{OPEN}}$	O	Loading motor open command (ON at "L")
39	P32	$\overline{\text{TRREV}}$	O	Traverse reverse command signal
40	P33	$\overline{\text{TRFWD}}$	O	Traverse forward command signal
41	VL1	——	I	LCD drive power supply (3.33V)
42	VL2	——	I	LCD drive power supply (1.67V)
43	VL3	——	I	LCD drive power supply (0V)
44 ≀ 46	COM0 ≀ COM2	——	O	LCD common line output
47	COM3	——	O	Not used (open)
48 ≀ 64	SEG0 ≀ SEG16	——	O	LCD segment line output

• AN8280LF (Spindle Motor Drive)

Pin No.	Mark	I/O Device	Function
1	FGP	O	FG pulse output
2	VCC	I	Power supply
3	PC	I	Motor drive command input and capacitor connection for phase compesation
4	SC	O	Current detection
5	B1	O	Spindle motor drive signal output
6	B2		
7	A2		
8	A1		

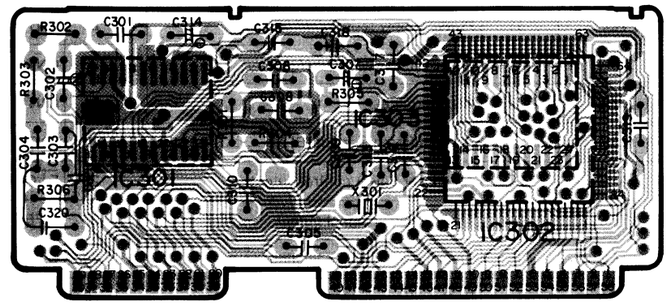
Pin No.	Mark	I/O Device	Function
9	HB	O	Hall element bias voltage output
10	DCR	I	Reference voltage input
11	FAO	O	Loop filter amplifier constant connection
12	FIA	I	Spindle motor control and loop filter amplifier constant connection
13	H2−	I	Hall element's Hall voltage input (inversion)
14	H2+	I	Hall element's Hall voltage input (non-inversion)
15	HI−	I	Hall element's Hall voltage input (inversion)
16	HI+	I	Hall element's Hall voltage input (non-inversion)

■ PRINTED CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

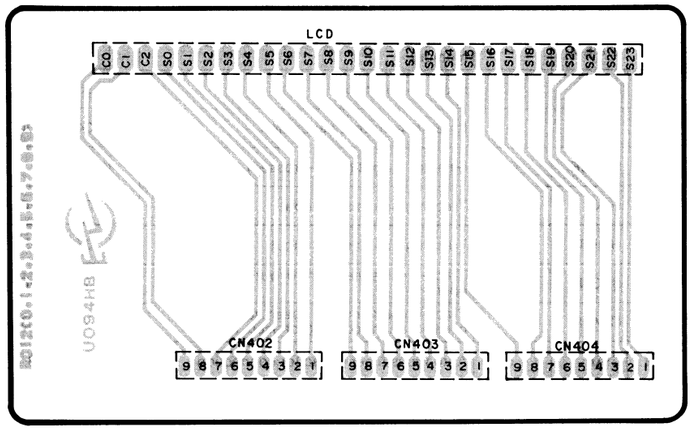


■ PRINTED CIRCUIT BOARDS

G (Digital P.C.B.)

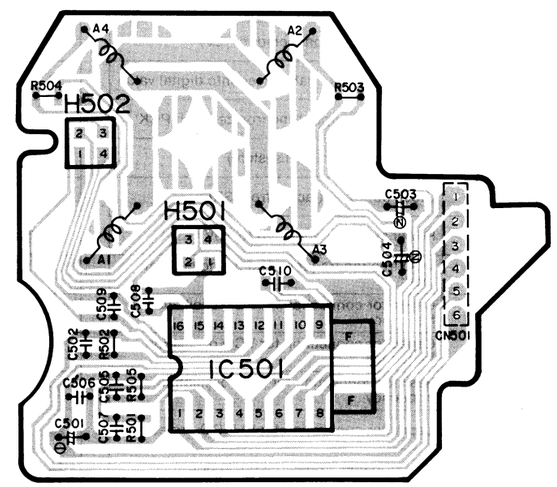


D (Display P.C.B.)

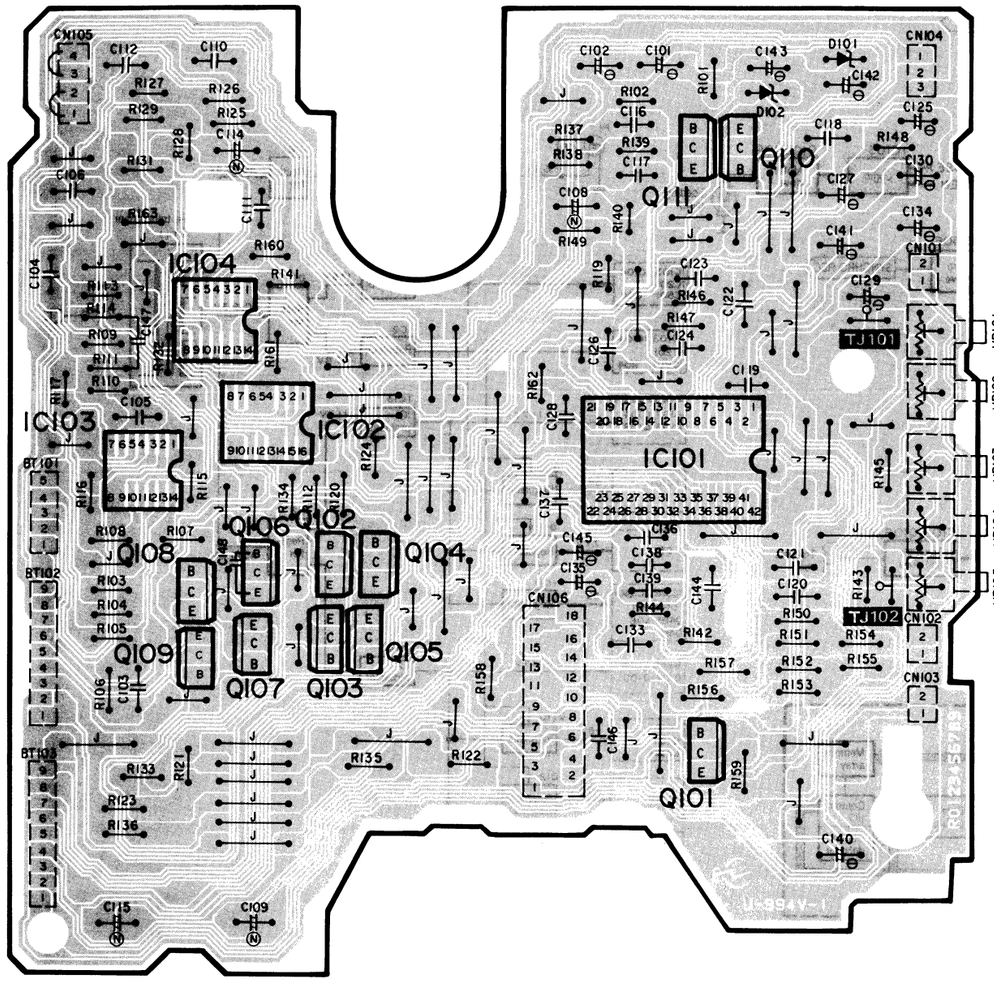


F (Spindle motor drive P.C.B.)

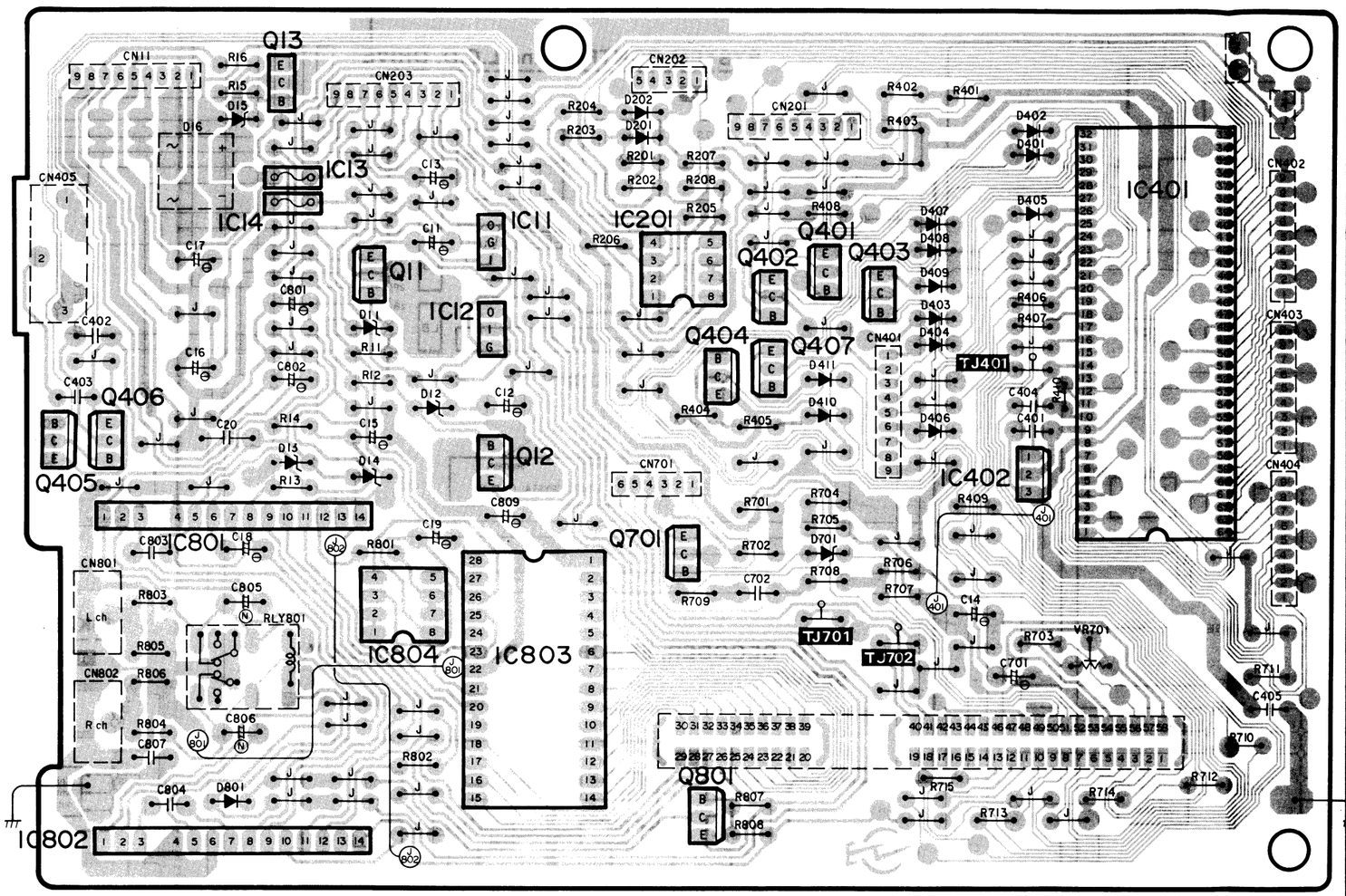
Note: The spindle motor drive circuit board is made by iron. It is very difficult to replace the parts on the circuit board. So, the repair parts are supplied in the from of finished P.C.B.



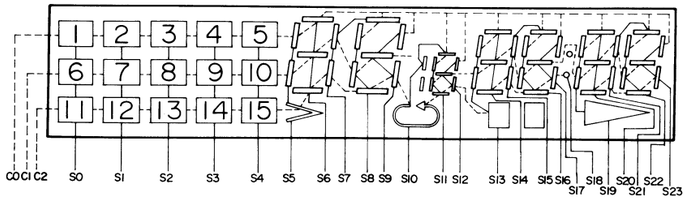
A (Optical servo P.C.B.)



B (Main P.C.B.: Regulator, system control, audio)



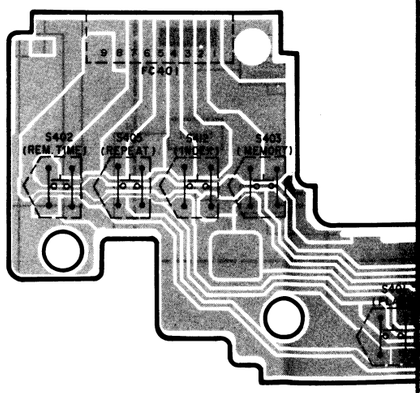
• Internal connections of liquid crystal display



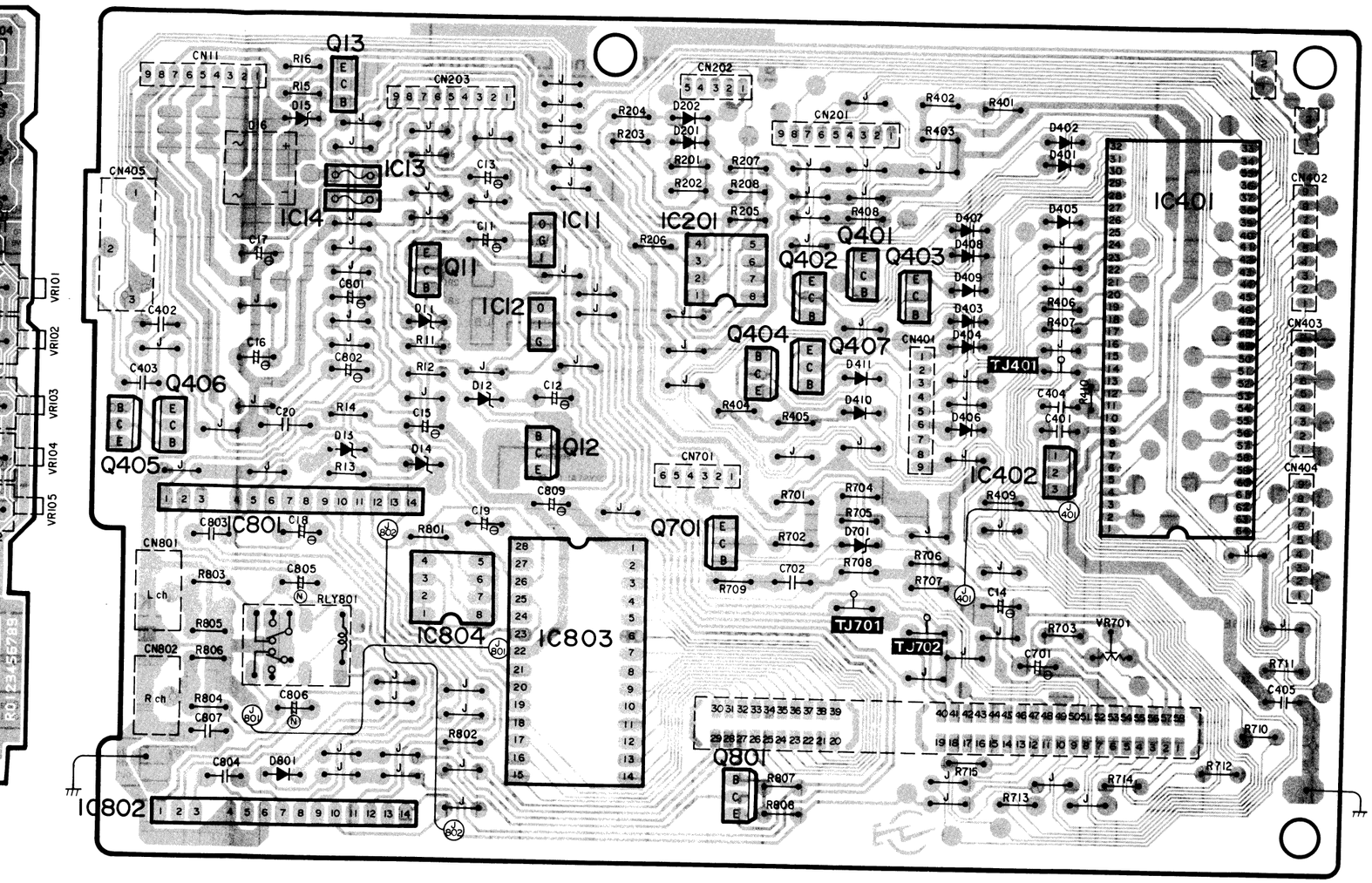
• Terminal guide of IC's, transistors and diodes

AN78M12,AN78M05 I. VIN G. GND O. VOUT	AN8370S ·····42pin MN4053BS·····16pin AN6554NS ·····14pin MN4416S ·····24pin AN8371S ·····24pin No. 1	AN6552····· 8pin MN15845PDB·····64pin SVIPCM54JP ·····28pin SVILM833NA ····· 8pin No. 1	MN6617F·····84pin Mark No. 1	2SD973,2SB793 2SC2021,2SD1055 2SB822 B C E	SVDS1WB40	MA4082,MA4056 MA4100,MA4091 Mark K A K A
AN79N12,AN79N05 G. GND I. VIN O. VOUT				2SD1189 E C B	UN4212 E C B 10K 10K	MA165 K A K A
SVIFU15 1. In 2. Out	AN8280LF 8 14 7 1	MN1280R 1...OUT 2...VSS 3...VDD	SVIAL072-1 14 1	2SA1309 E C B	UN4112 E C B 10K 10K	

C (Key switch P.C.B.)

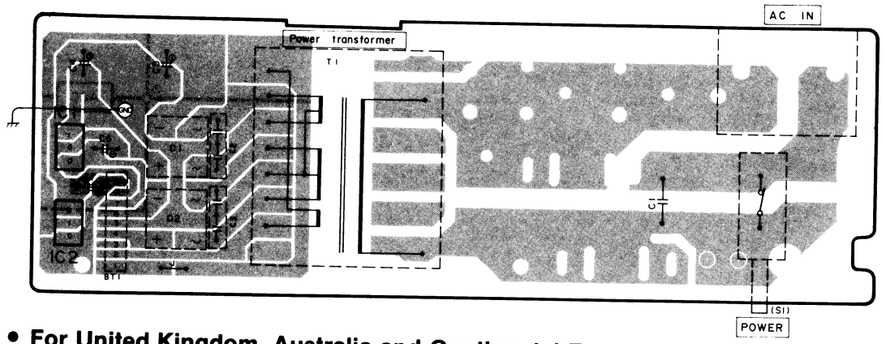


B (Main P.C.B.: Regulator, system control, audio)

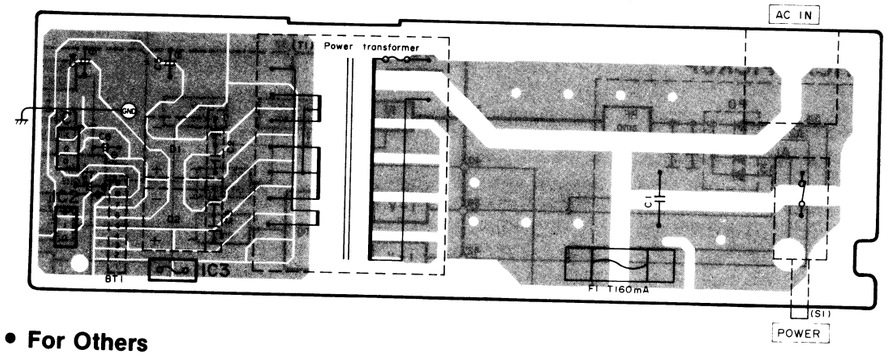


E (Power supply P.C.B.)

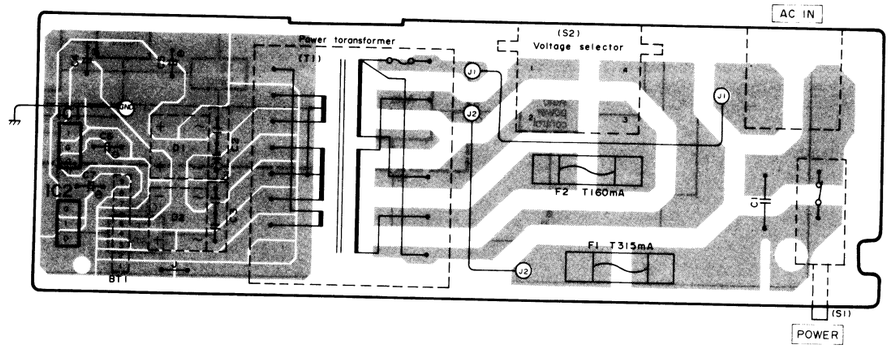
- For U.S.A. and Canada



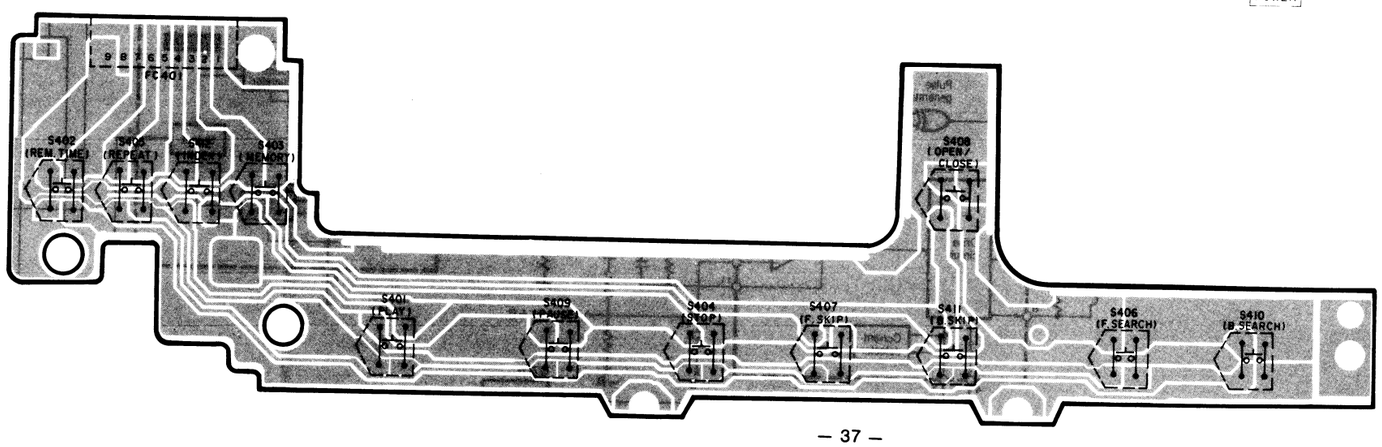
- For United Kingdom, Australia and Continental Europe



- For Others



C (Key switch P.C.B.)

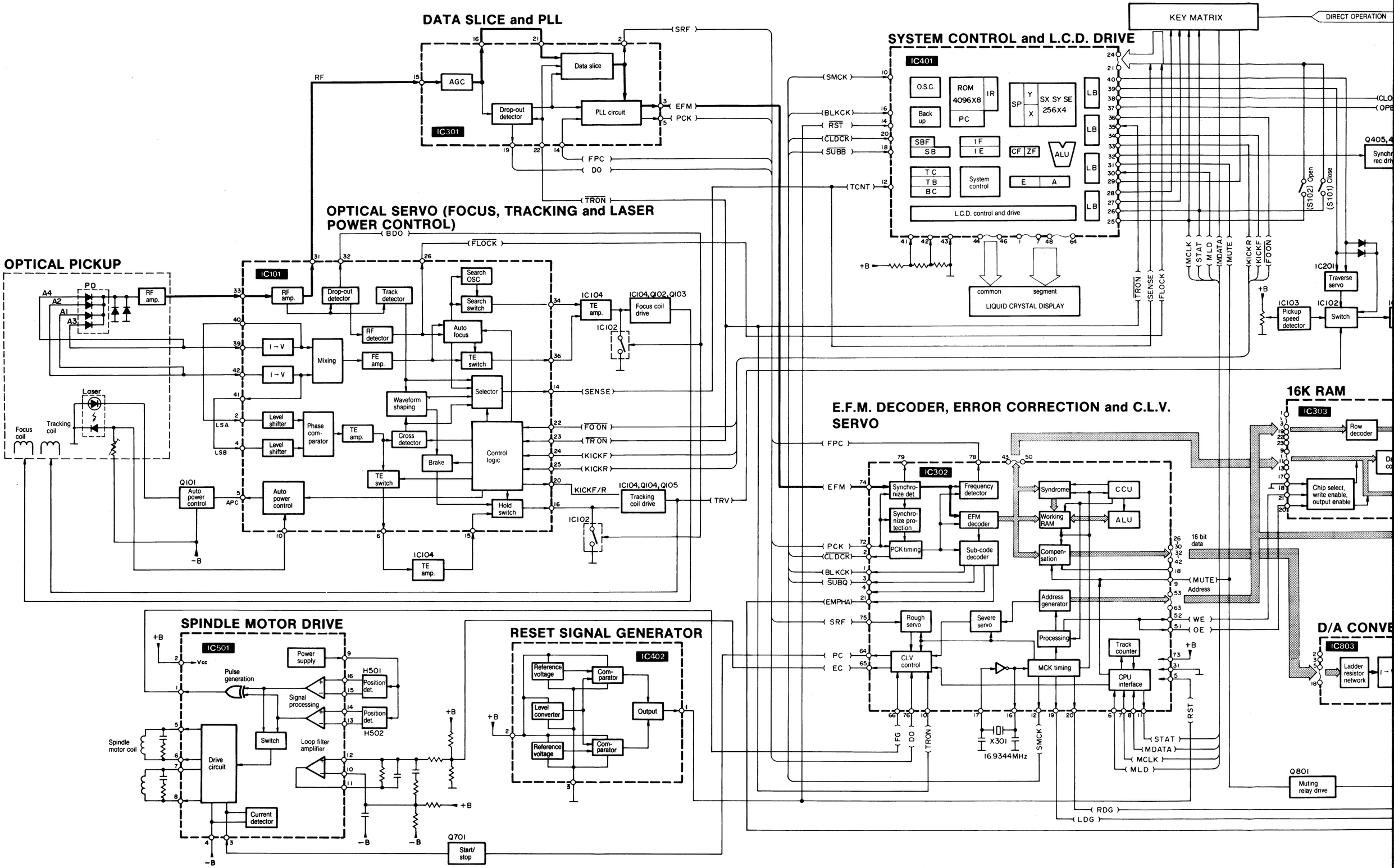


IC's, transistors and diodes

8370S ·····42pin 4053BS·····16pin 6554NS·····14pin 4416S ·····24pin 8371S ·····24pin	AN6552····· 8pin MN15845PDB·····64pin SVIPCM54JP ·····28pin SVILM833NA ····· 8pin	MN6617F·····84pin	2SD973,2SB793 2SC2021,2SD1055 2SB822	SVDS1WB40	MA4082,MA4056 MA4100,MA4091
			2SD1189	UN4212	MA165
280LF	MN1280R	SVIAL072-1	2SA1309	UN4112	

SL-PJ11 SL-PJ11

■ BLOCK DIAGRAM



and PLL

Data slice
PLL circuit
op-out tector
SRF
EFM
PCK
FPC
DO
TRON

TRACKING and LASER

IC104 TE amp.
IC104,Q102,Q103 Focus coil drive
IC102
SENSE
FO ON
TR ON
KICKF
KICKR
KICKF/R
IC104,Q104,Q105 Tracking coil drive
TRV
IC102

RESET SIGNAL GENERATOR

IC402
Reference voltage
Comparator
Level converter
Output
Reference voltage
Comparator

SYSTEM CONTROL and L.C.D. DRIVE

IC401
O.S.C.
Back up
ROM 4096X8
IR
PC
SP
Y
X
SX SY SE 256X4
LB
SBF
SB
IF
IE
CF ZF
ALU
TC
TB
BC
System control
E
A
L.C.D. control and drive
SMCK
BLKCK
RST
CLDCK
SUBB
TCNT
+B
common
segment
LIQUID CRYSTAL DISPLAY
TRON
SENSE
FLOCK
MCLK
STAT
MLD
MDATA
MUTE
KICKR
KICKF
FOON

KEY MATRIX
DIRECT OPERATION

CLOSE
OPEN
IC103 Logic
Q108,109 Motor drive
Loading motor
Q405,406 Synchro rec drive
SYNCHRO REC
(S102) Open
(S101) Close
IC201 Traverse servo
IC103 Pickup speed detector
IC102 Switch
IC103,Q106,107 Traverse coil drive
Traverse coil

E.F.M. DECODER, ERROR CORRECTION and C.L.V. SERVO

IC302
FPC
EFM
PCK
CLDCK
BLKCK
SUBQ
EMPHA
SRF
PC
EC
Synchronize det.
Frequency detector
Synchronize protection
EFM decoder
PCK timing
Sub-code decoder
Rough servo
Severe servo
CLV control
Syndrome
CCU
Working RAM
ALU
Compensation
Address generator
Processing
MCK timing
Track counter
CPU interface
16 bit data
MUTE
Address
WE
OE
+B
RST
FG
DO
TRON
X301
16.9344MHz
SMCK
STAT
MDATA
MCLK
MLD
RDG
LDG

16K RAM

IC303
Row decoder
Memory array
Data control
Column I/O
Column decoder
Chip select, write enable, output enable

D/A CONVERTER

IC803
Ladder resistor network
I → V

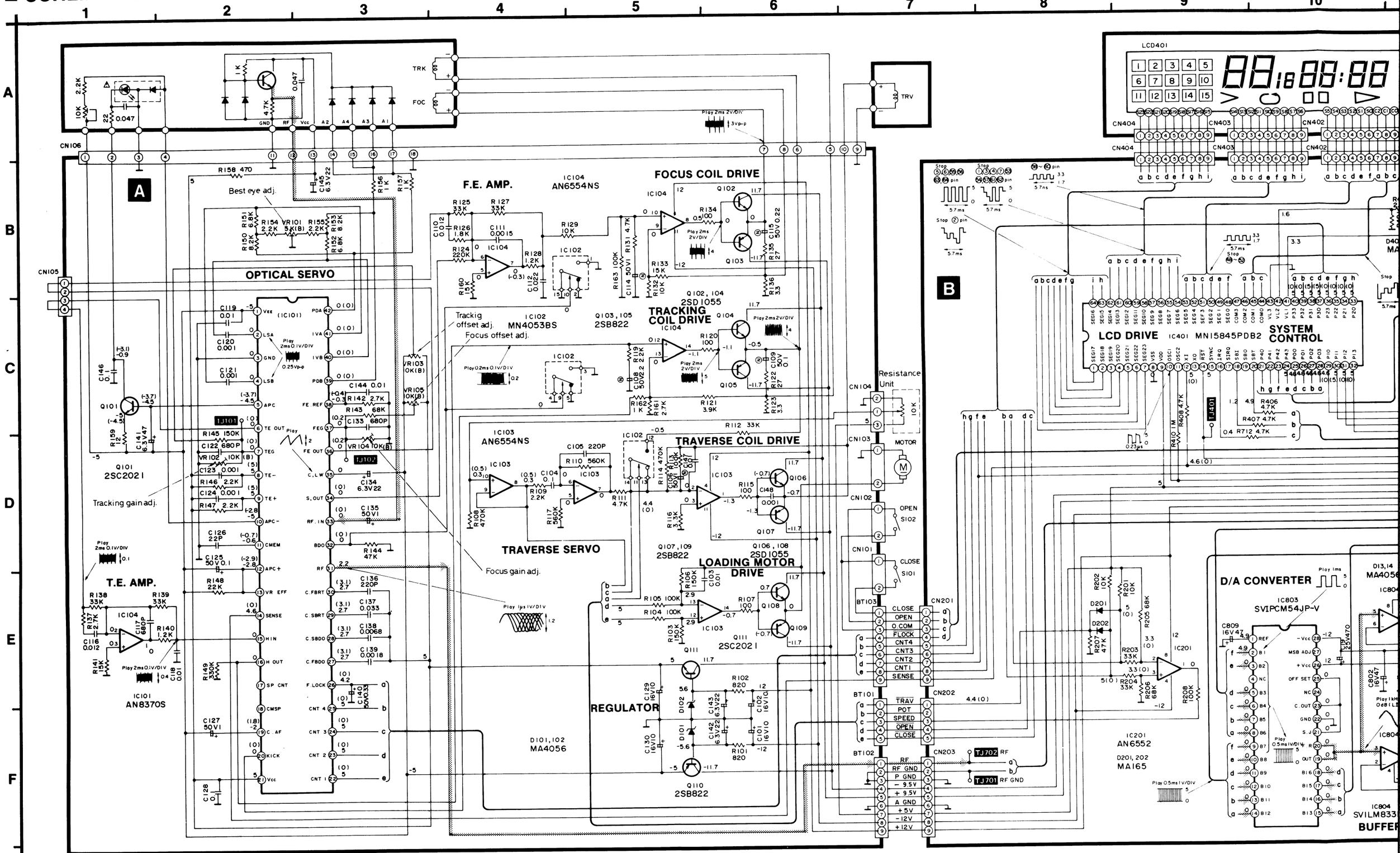
AUDIO

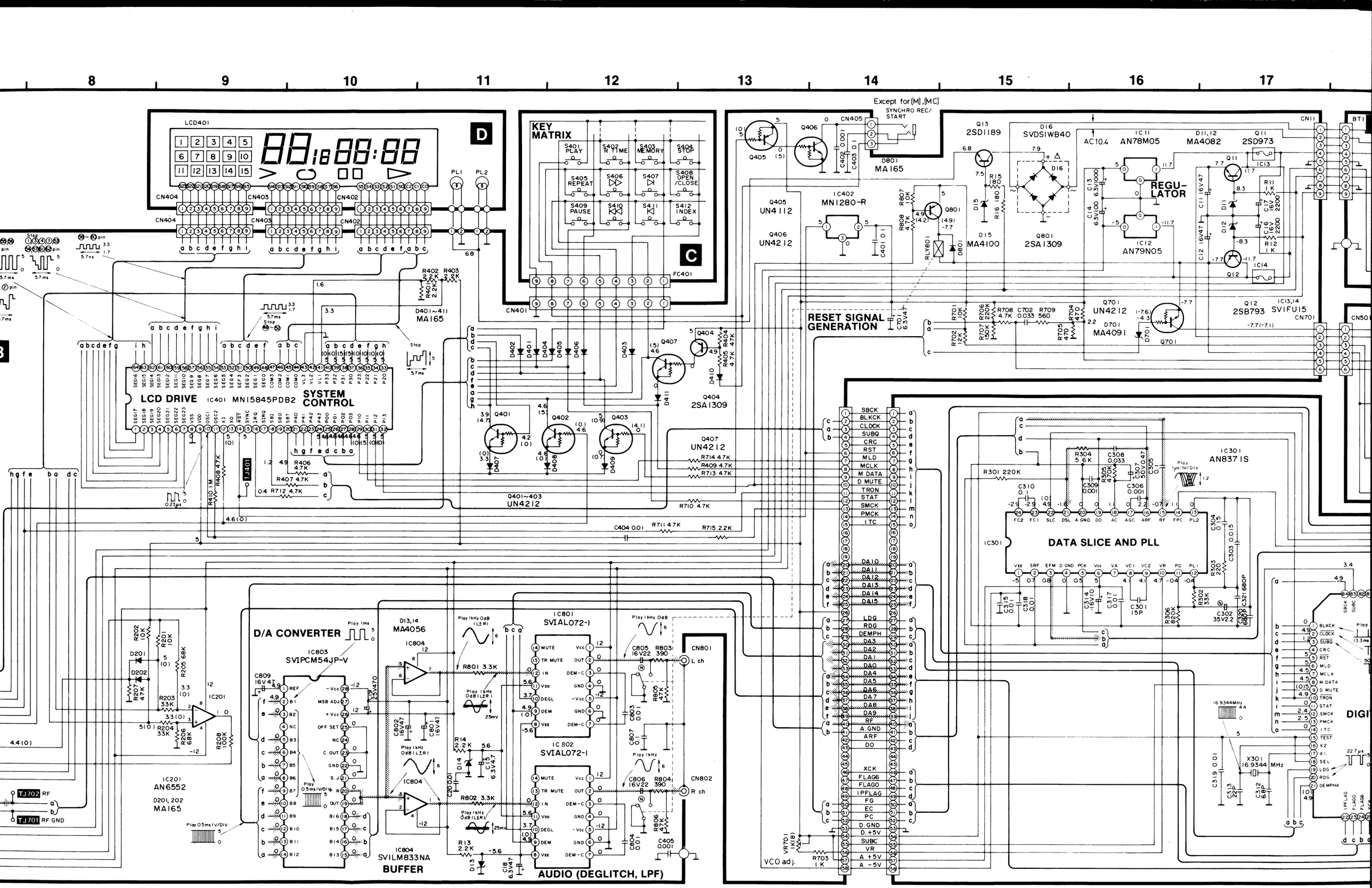
IC804 Buffer amp.
IC801
Deglitch
L.P.F.
De-emphasis
IC802
Deglitch
L.P.F.
De-emphasis
(Lch)
(Rch)
Muting relay
Q801 Muting relay drive

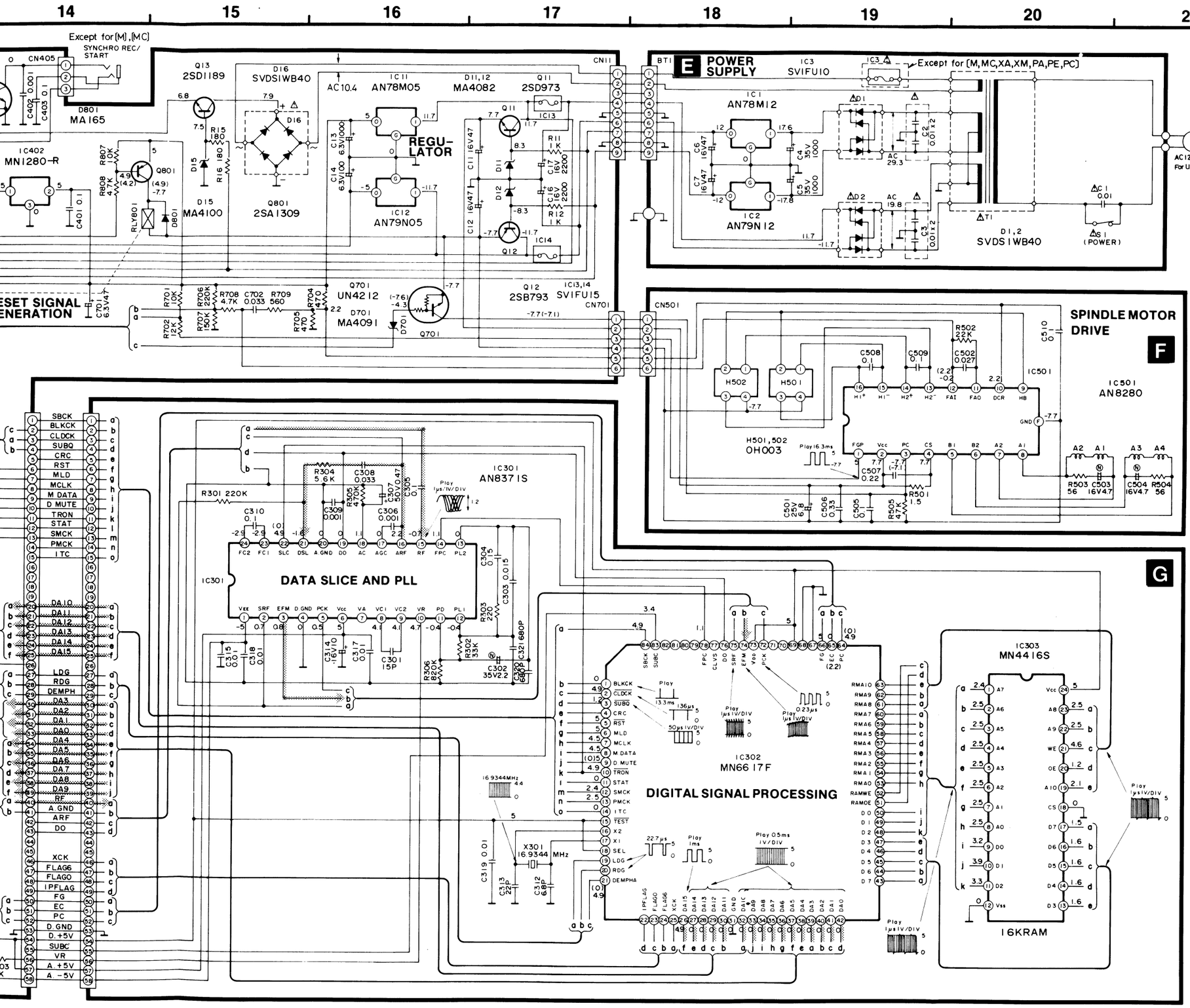
POWER SUPPLY

PL1 PL2
Q13 Regulator 6.8V
DI6 Rectifier AC 10.4V
Power transformer (T1)
Power (S1)
IC103, IC104 IC201 IC801 804
IC1 Regulator 12V 17.6V
DI Rectifier AC29.3V
IC2 Regulator -12V -17.8V
Q102,Q104 Q106,Q108 11.7V
IC13 IC protector 11.7V
IC101 5V Q111 Regulator
IC501 7.7V Q11 Regulator
IC302,303,401 IC402,501 Q405,406 Q801 5V IC11 Regulator
Q103, Q105 Q107, Q109 -11.7V
IC14 IC protector -11.7V
IC101 Q101 Laser -5V Q110 Regulator
IC501 -7.7V Q12 Regulator
IC301 -5V IC12 Regulator
D2 Rectifier AC19.8V

■ SCHEMATIC DIAGRAM (This schematic diagram may be modified at anytime with the development of new technology.)




LCD401
KEY MATRIX
S401 PLAY
S402 R TIME
S403 MEMORY
S404 STOP
S405 REPEAT
S406
S407
S408 OPEN /CLOSE
S409 PAUSE
S410
S411
S412 INDEX
FC401
CN401
CN404
CN403
CN402
PL1
PL2
LCD DRIVE IC401 MN15845PDB2
SYSTEM CONTROL
Except for [M],[MC]
SYNCHRO REC/ START
Q405 UN4112
Q406 UN4212
IC402 MN1280-R
DB01 MA165
Q13 2SD1189
D16 SVDSIWB40
IC11 AN78M05
D11,12 MA4082
Q11 2SD973
REGU-LATOR
IC12 AN79N05
Q801 2SA1309
D15 MA4100
Q801 UN4212
RESET SIGNAL GENERATION
Q701 UN4212
D701 MA4091
Q12 2SB793
IC13,14 SVIFU15
CN701
CN11
BT1
CN50
Q401 UN4212
Q404 2SA1309
Q407 UN4212
Q401~403 UN4212
D401~411 MA165
R402 2.2K
R403 2.2K
R401 2.2K
R406 4.7K
R407 4.7K
R712 4.7K
R710 4.7K
R714 4.7K
R409 4.7K
R713 4.7K
R711 4.7K
R715 2.2K
C404 0.01
TJ401
SBCK
BLKCK
CLDCK
SUBQ
CRC
RST
MLD
MCLK
M DATA
D MUTE
TRON
STAT
SMCK
PMCK
ITC
IC301 AN8371S
DATA SLICE AND PLL
DA10
DA11
DA12
DA13
DA14
DA15
LDG
RDG
DEMPH
DA3
DA2
DA1
DA0
DA4
DA5
DA6
DA7
DA8
DA9
RF
A.GND
ARF
DO
XCK
FLAG6
FLAGO
IPFLAG
FG
EC
PC
D.GND
D.+5V
SUBC
VR
A.+5V
A.-5V
VR701 1K(B)
R703 1K
VCO adj.
X301 16.9344MHz
TJ702 RF
TJ701 RF GND
IC201 AN6552
D201, 202 MA165
D/A CONVERTER
IC803 SVIPCM54JP-V
IC804 SVILM833NA
BUFFER
D13,14 MA4056
IC801 SVIAL072-I
IC 802 SVIAL072-I
AUDIO (DEGLITCH, LPF)
CN801 L ch
CN802 R ch



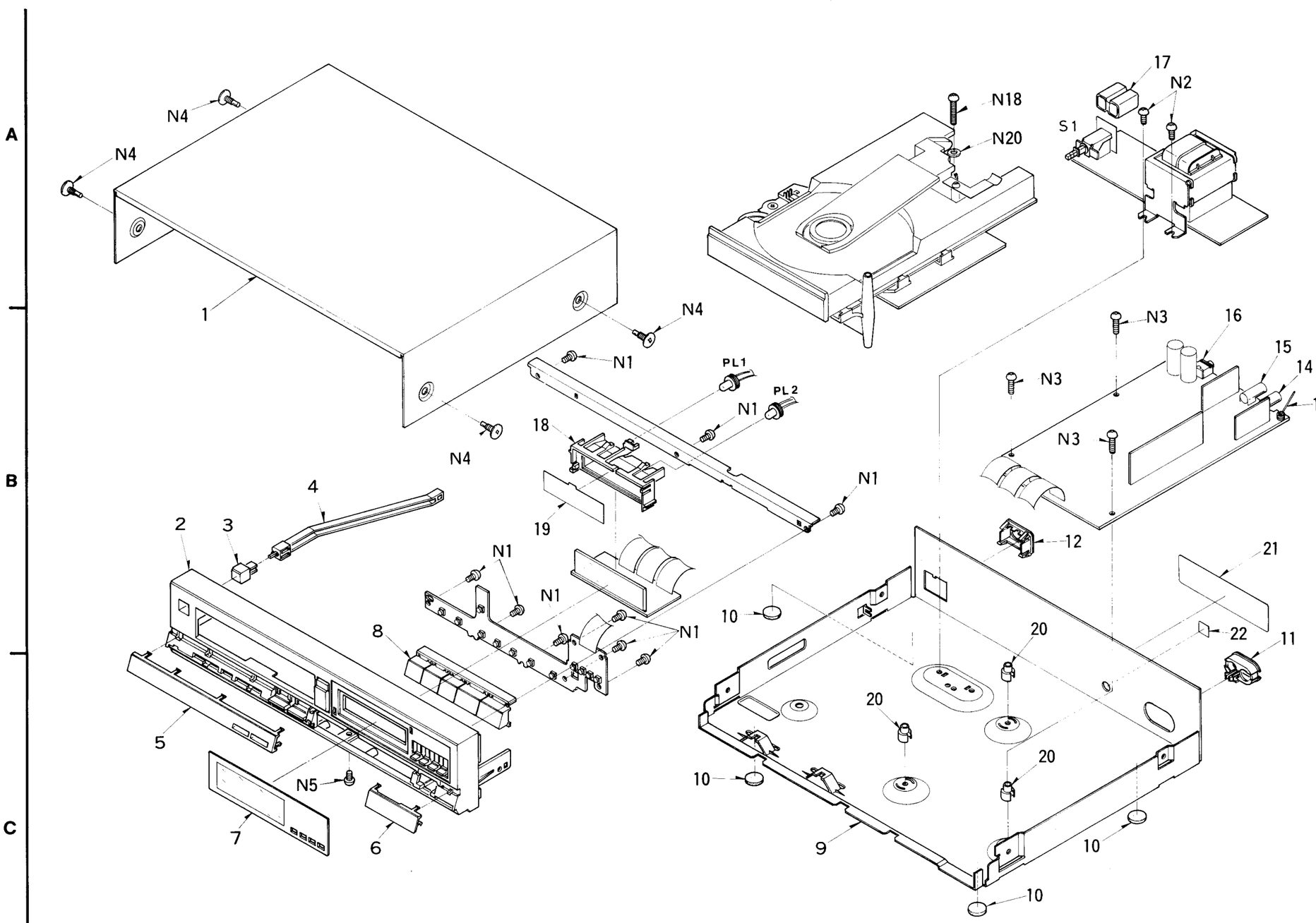
- **Power supply circuit**

Notes:

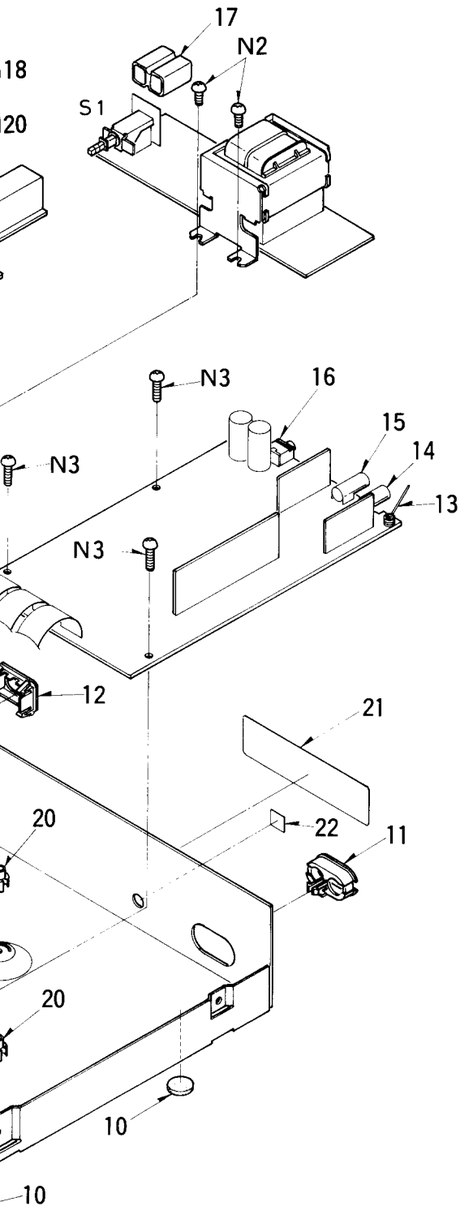
1. **S1** : Power switch.
2. **S2** : Voltage selector switch. (For [XA], [XM], [PA], [PE] and [PC] areas)
3. **S101** : Disc holder close detection switch.
4. **S102** : Disc holder open detection switch.
5. **S401** : Play switch.
6. **S402** : Remaining time switch.
7. **S403** : Memory/recall switch.
8. **S404** : Stop/clear switch.
9. **S405** : Repeat switch.
10. **S406** : Forward search switch.
11. **S407** : Forward skip switch.
12. **S408** : Open/close switch.
13. **S409** : Pause switch.
14. **S410** : Backward search switch.
15. **S411** : Backward skip switch.
16. **S412** : Index switch.
17. The voltage value, and waveform are the reference voltage of this unit measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of chassis. Accordingly, there may arise some error in the voltage values and waveforms depending upon the internal impedance of the tester or the measuring unit.
    * The parenthesized are the values of voltage generated during playing (Test disc 1 kHz L+R 0dB). Others are the voltage values in stop mode.
18. Important safety notice:
    Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
19. ——— : Positive voltage lines and negative voltage lines.
    ⋯⋯ : Audio signal lines.

■ EXPLODED VIEW

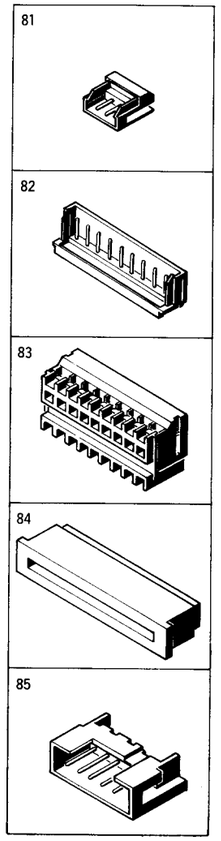
• **Cabinet and chassis parts**



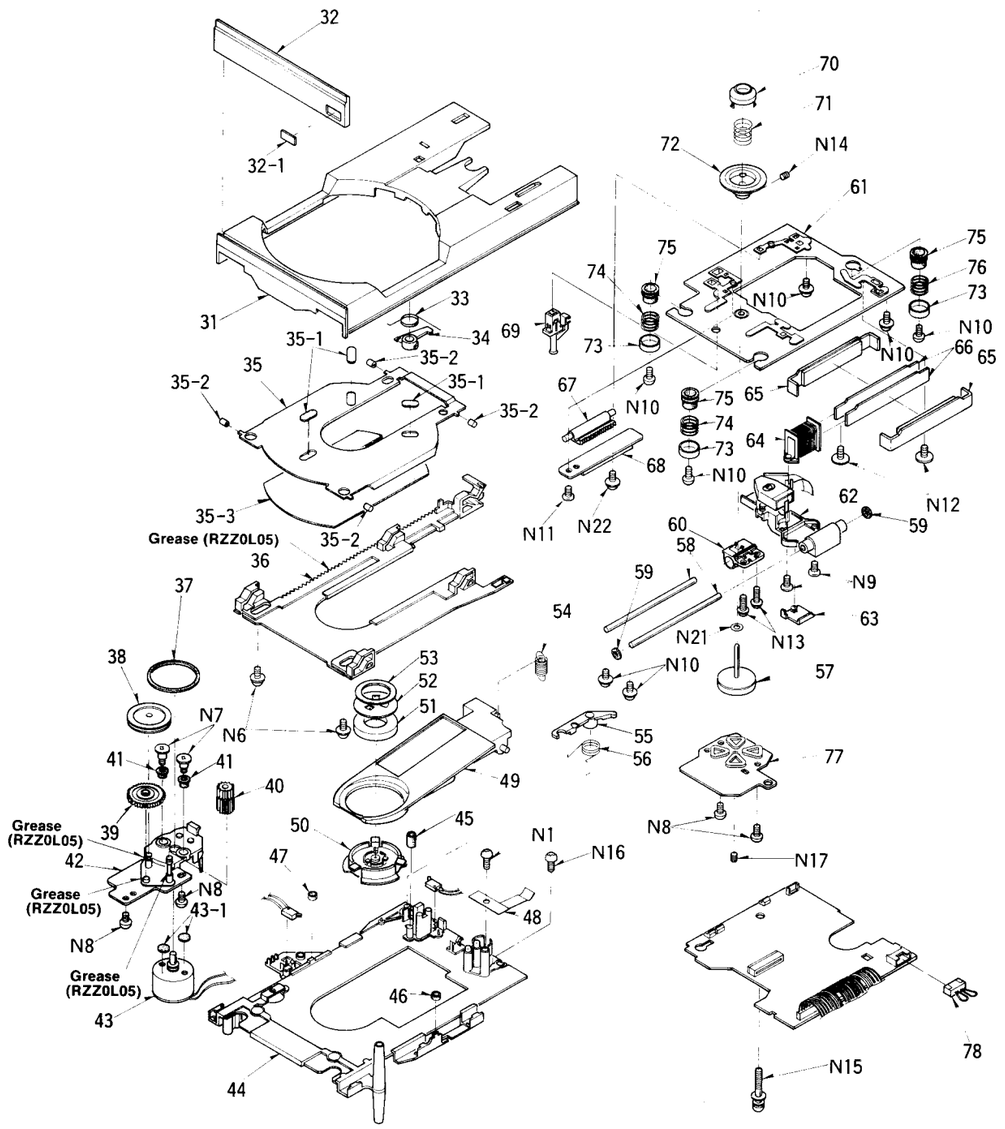
| | | |



- **Connectors**



- **Traverse deck parts**



■ REPLACEMENT PARTS LIST

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice:
   Components identified by ⚠ mark have special characteristics important for safety.
   When replacing any of these components, use only manufacture's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
4. The "Ⓢ" mark is service standard parts and may differ from production parts.
5. The parenthesized numbers in the columns of description stand for the quantity per set.

Ref. No.	Part. No.	Description
INTEGRATED CIRCUITS		
IC1	AN78M12	Integrated circuit
IC2	AN79N12	Integrated circuit
IC3	⚠ SVIFU10	Integrated circuit
Except for [M, MC, XA, XM, PA, PE, PC]		
IC11	AN78M05	Integrated circuit
IC12	AN79N05	Integrated circuit
IC13, 14	SVIFU15	Integrated circuit
IC101	AN8370S	Integrated circuit
IC102	MN4053BS	Integrated circuit
IC103, 104	AN6554NS	Integrated circuit
IC201	AN6552	Integrated circuit
IC301	AN8371S	Integrated circuit
IC302	MN6617F	Integrated circuit
IC303	MN4416S-12	Integrated circuit
IC401	MN15845PDB2	Integrated circuit
IC402	MN1280-R	Integrated circuit
IC501	AN8280LF	Integrated circuit
IC801, 802	SVIAL072-1	Integrated circuit
IC803	SVIPCM54JP-V	Integrated circuit
IC804	SVILM833NA	Analog Switch
TRANSISTORS		
Q11	2SD973	Transistor
Q12	2SB793	Transistor
Q13	2SD1189	Transistor
Q101, 111	2SC2021	Transistor
Q102, 104, 106, 108	2SD1055	Transistor
Q103, 105, 107, 109, 110	2SB822	Transistor
Q401, 402, 403, 406, 407	UN4212	Transistor
Q404	2SA1309Q	Transistor
Q405	UN4112	Transistor
Q701	UN4212	Transistor
Q801	2SA1309Q	Transistor

Ref. No.	Part. No.	
DIODES		
D1, 2	⚠ SVDS1WB40	F
D11, 12	MA4082M	8
D13, 14	MA4056-M	5
D15	MA4100	1
D16	⚠ SVDS1WB40	F
D101, 102	MA4056-M	5
D201, 202	MA165	D
D401~411	MA165	D
D701	MA4091TA	9
D801	MA165	D
CRYSTAL		
X301	SVQ16CKSS	1
HALL ELEMENT		
H501, 502	OH-003	P
VARIABLE RESISTORS		
VR101, 104	EVND1AA00B53	V
VR102, 103, 105	EVND1AA00B14	V
VR701	EVN38CA00B13	V
RELAY		
RLY801	SFDYG5A237P	M
SWITCHES		
S1	⚠ ESB823V	P
S2	⚠ SRDSHXW0251	V
[XA, XM, PA, PE, PC] only		
S101, 102	SRDSMLS-2	O
S401~412	EVQQS405K	O
LIQUID CRYSTAL DISPLAY		
LCD401 [M, MC]	SALD2	D
LCD401 [Other]	SALD2-1	D

																							A
																							B
																							C
																							D
																							E
																							F

■ REPLACEMENT PARTS LIST

Notes:
1. Part numbers are indicated on most mechanical parts. Please use this part number for parts order.
2. Important safety notice:
   Components identified by ⚠ mark have special characteristics important for safety.
   When replacing any of these components, use only manufacture's specified parts.
3. Bracketed indications in Ref. No. columns specify the area. Parts without these indications can be used for all areas.
4. The "Ⓢ" mark is service standard parts and may differ from production parts.
5. The parenthesized numbers in the columns of description stand for the quantity per set.

Areas

[M] ..... U.S.A.
[MC] ... Canada
[E] ..... Switzerland and Scandinavia
[EK] .... United Kingdom
[XL] .... Australia
[EG] ... F.R. Germany
[EB] .... Belgium
[EH] .... Holland
[EF] .... France
[Ei] ..... Italy
[EC] .... Czechoslovakia
[XA] .... Southeast Asia, Oceania, Africa, Middle Near East and Central South America
[XM] ... Central South America
[PA] .... Far East PX
[PE] .... European Military
[PC] .... European Audio Club

Ref. No.	Part. No.	Description
INTEGRATED CIRCUITS		
IC1	AN78M12	Integrated circuit
IC2	AN79N12	Integrated circuit
IC3	⚠SVIFU10	Integrated circuit
Except for [M, MC, XA, XM, PA, PE, PC]		
IC11	AN78M05	Integrated circuit
IC12	AN79N05	Integrated circuit
IC13, 14	SVIFU15	Integrated circuit
IC101	AN8370S	Integrated circuit
IC102	MN4053BS	Integrated circuit
IC103, 104	AN6554NS	Integrated circuit
IC201	AN6552	Integrated circuit
IC301	AN8371S	Integrated circuit
IC302	MN6617F	Integrated circuit
IC303	MN4416S-12	Integrated circuit
IC401	MN15845PDB2	Integrated circuit
IC402	MN1280-R	Integrated circuit
IC501	AN8280LF	Integrated circuit
IC801, 802	SVIAL072-1	Integrated circuit
IC803	SVIPCM54JP-V	Integrated circuit
IC804	SVILM833NA	Analog Switch
TRANSISTORS		
Q11	2SD973	Transistor
Q12	2SB793	Transistor
Q13	2SD1189	Transistor
Q101, 111	2SC2021	Transistor
Q102, 104, 106, 108	2SD1055	Transistor
Q103, 105, 107, 109, 110	2SB822	Transistor
Q401, 402, 403, 406, 407	UN4212	Transistor
Q404	2SA1309Q	Transistor
Q405	UN4112	Transistor
Q701	UN4212	Transistor
Q801	2SA1309Q	Transistor

Ref. No.	Part. No.	Description
DIODES		
D1, 2	⚠SVDS1WB40	Rectifier
D11, 12	MA4082M	8.2V Zener Diode
D13, 14	MA4056-M	5.6V Zener Diode
D15	MA4100	10V Zener Diode
D16	⚠SVDS1WB40	Rectifier
D101, 102	MA4056-M	5.6V Zener Diode
D201, 202	MA165	Diode
D401~411	MA165	Diode
D701	MA4091TA	9.1V Zener Diode
D801	MA165	Diode
CRYSTAL		
X301	SVQ16CKSS	16.39 MHz
HALL ELEMENT		
H501, 502	OH-003	Position Detection
VARIABLE RESISTORS		
VR101, 104	EVND1AA00B53	Volume 5kΩ (B)
VR102, 103, 105	EVND1AA00B14	Variable Resistor 10kΩ (B)
VR701	EVN38CA00B13	Variable Resistor 1kΩ (B)
RELAY		
RLY801	SFDYG5A237P	Muting
SWITCHES		
S1	⚠ ESB823V	Power
S2	⚠ SRDSHXW0251	Voltage Selector
[XA, XM, PA, PE, PC] only		
S101, 102	SRDSMLS-2	Open and Close Detector
S401~412	EVQQS405K	Operation
LIQUID CRYSTAL DISPLAY		
LCD401 [M, MC]	SALD2	Display
LCD401 [Other]	SALD2-1	Display

Ref. No.	Part. No.	Description
COMPONENT COMBINATION		
C2, 3	⚠RXAF103Z22EY	0.01μ×2
LAMP		
PL1, 2	XAMS18S150A	
POWER TRANSFORMERS		
T1 [M]	⚠SLT54JL10A	Power Source
T1 [MC]	⚠SLT54JS23C	Power Source
T1 [XA, XM, PA, PE, PC]	⚠SLT54JS25E	Power Source
T1 [Other]	⚠SLT54JE24E	Power Source
FUSES		
F1 [XA, XM, PA, PE, PC]	⚠XBA2C03TBO	250V, T315mA
F1 Except for [M, MC]	⚠XBA2C016TBO	250V, T160mA
F2 [XA, XM, PA, PE, PC]	⚠XBA2C016TBO	250V, T160mA

LSI SXP0210

Ref. No.	Part. No.	Description	
CABINET AND CHASSIS PARTS			
1	SKCD1-1	Cabinet	(1)
2	SGYD1-1E	Front Panel	(1)
3	SRKTJ02N21	Knob, Power	(1)
4	SUBD1	Rod, Power Switch	(1)
5	SGXD7-1	Ornament Plate (A)	(1)
6	SGXD8-1	Ornament Plate (B)	(1)
7	SGUD4	Ornament Plate, Display	(1)
8	SBCD13-1	Button, Operation	(1)
9 [XA, XM, PA, PE, PC]	SGPD3-1	Chassis	(1)
9 [Other]	SGPD3	Chassis	(1)
10	SRGA008N01	Foot	(4)
11	SJFD1	Holder, Output Terminal	(1)
12 [XL]	SJVD0204A	Holder, AC Socket	(1)
12 [Other]	SJVD0203A	Holder, AC Socket	(1)
13	SRQS001N01	Spring, Ground	(1)
14	SRDJ007N05	Jack (Red)	(1)
15	SRDJ007N06	Jack (White)	(1)
16 Except for [M, MC]	SFDJD04N02	Jack, Synchro Rec	(1)
17	⚠SJVD0203B	AC Socket	(1)
18	SMPD1	Holder, L.C.D.	(1)
19 [M, MC]	SDUD4	Filter, L.C.D.	(1)
19 [Other]	SDUD4-1	Filter, L.C.D.	(1)
20	SHE185	Spacer	(3)
21 [M]	SGTD3	Name Plate	(1)
21 [MC]	SGTD4	Name Plate	(1)
21 [E, EC]	SGTD5	Name Plate	(1)
21 [EK]	SGTD6	Name Plate	(1)
21 [EG]	SGTD7	Name Plate	(1)
21 [XA, XM]	SGTD8	Name Plate	(1)
21 [PA, PE, PC]	SGTD9	Name Plate	(1)
21 [XL]	SGTD17	Name Plate	(1)
21 [Other]	SGTD10	Name Plate	(1)
22 [M, MC] only	SFNHQ06M01	Seal, Synchro Rec	(1)
TRAVERSE DECK PARTS			
31	SIRD1-1	Case	(1)
32	SGXD9-1E	Ornament Plate	(1)
32-1	SGBD2-1	Badge	(1)
33	SUSD10	Spring	(1)
34	SIRD3	Lever	(1)
35	SIWD3E	Tray Ass'y	(1)
35-1	SHGD7-1	Rubber	(3)
35-2	SIRD4	Spacer	(4)
35-3	SHGD19	Rubber	(1)
36	SISD3	Drive Rack	(1)

Ref. No.	Part. No.	Description	
37	SRGB007N02	Belt	(1)
38	SDGD10	Gear	(1)
39	SDGD11	Gear	(1)
40	SDGD12	Gear	(1)
41	SHGD5	Rubber	(2)
42	SISD2E	Bracket	(1)
43	SJGD2E	Motor Ass'y	(1)
43-1	SHGD6	Rubber	(2)
44	SISD1	Loading Base	(1)
45	SHGD11	Rubber	(1)
46	SHGD24	Rubber	(1)
47	SHGD20	Rubber	(1)
48	SUSD16	Spring	(1)
49	SIRD5	Disc Clamper	(1)
50	SIRD6	Holder	(1)
51	SOMD4	Magnet	(1)
52	SOYD2	Yoke	(1)
53	SHGD8	Rubber	(1)
54	SUSD11	Spring	(1)
55	SIRD2	Lever	(1)
56	SUSD9	Spring	(1)
57	SDMD2A	Rotor Ass'y	(1)
58	SUXD15	Shaft	(2)
59	SHGD10	Rubber	(2)
60	EWSL03	Holder	(1)
61	SISD4E	Traverse Base	(1)
62	⚠SOAD20A	Optical Pick-up Ass'y	(1)
63	SORD7	Cover	(1)
64	SORD5E	Coil	(1)
65	SOYD3E	Yoke (A)	(2)
66	SOYD4	Yoke (B)	(2)
67	SDGD13	Gear	(1)
68	EWS7AJ	Resistance Unit	(1)
69	SHRD4	Lock Unit	(1)
70	SDOD8	Ring	(1)
71	SRQA010N04	Spring	(1)
72	SDOD7-1	Turntable Ass'y	(1)
73	SHRD3	Holder	(3)
74	SUSD12	Spring (A)	(2)
75	SHGD9	Rubber	(3)
76	SUSD13	Spring (B)	(1)
77	SXPD220	Spindle P.C.B. Ass'y	(1)
78	SRDJ001N14E	Connector Ass'y	(1)
CONNECTORS			
81	EMCS0250ZL	Connector (White), CN103	(1)
81	EMCS0250ZLB	Connector (Blue), CN101	(1)
81	EMCS0250ZLR	Connector (Red), CN102	(1)
82	EMCS0350Z	Connector (White), CN104	(1)
82	EMCS0550Z	Connector (White), CN202	(1)
82	EMCS0650Z	Connector (White), CN701	(1)
82	EMCS0950Z	Connector (White), CN11	(1)
82	EMCS0950ZMB	Connector (Blue), CN201	(1)
82	EMCS0950ZMR	Connector (Red), CN203	(1)
83	SJSD0905	Connector, CN401	(1)
84	SJS1703	Connector, CN106	(1)
85	EMCS0551ML	Connector, CN105	(1)

Ref. No.	Part. No.	Description	
SCREWS, WASHERS AND NUTS			
N1	XTB3+8G	Screw, ⊕3×8	(10)
N2	XTV3+6JFYR	Screw, ⊕3×6	(2)
N3	XTV3+14JFYR	Screw, ⊕3×14	(3)
N4	SRXG007N51	Screw	(4)
N5	XTV3+6JFZ	Screw, ⊕3×6	(1)
N6	XTW3+8Q	Screw, ⊕3×8	(2)
N7	SFXGB20-01	Screw	(2)
N8	XTV3+8G	Screw, ⊕3×8	(4)
N9	XYN26+C4	Screw, ⊕2.6×4	(2)
N10	XTV3+10G	Screw, ⊕3×10	(7)
N11	XTV3+6J	Screw, ⊕3×6	(1)
N12	SFXGQ06N01	Screw	(2)
N13	XYN26+W8	Screw, ⊕2.6×8	(2)
N14	XXE26D5	Screw	(1)
N15	SRXG007N11	Screw	(1)
N16	XYE3+EJ8	Screw, ⊕3×8	(1)
N17	SNSD3	Screw	(1)
N18	XTN3+40JFYR	Screw, ⊕3×40	(1)
N20	XWE3D8	Washer, φ3	(1)
N21	SRXW007N02	Washer	(1)
N22	XTW3+8T	Screw, ⊕3×8	(1)
ACCESSORIES			
A1 [M]	SQUD8	Instruction Book	(1)
A1 [MC]	SQUD45E	Instruction Book	(1)
A1 [EK]	SQUD47	Instruction Book	(1)
A1 [Ei]	SQUD49	Instruction Book	(1)
A1 [PA, PE, PC]	SQUD50E	Instruction Book	(1)
A1 [EH, EB, E]	SQUD51E	Instruction Book	(1)
A1 [Other]	SQUD46	Instruction Book	(1)
A2 [M, MC]	⚠SJA170	AC Cord	(1)
A2 [EK]	⚠SFDAC05G02	AC Cord	(1)
A2 [XL]	⚠SJA173	AC Cord	(1)
A2 [XA, XM, PA, PE, PC]	⚠SJA168-1	AC Cord	(1)
A2 [Other]	⚠SJA171	AC Cord	(1)
A3	SRDH001N01	Output Cord	(1)
A4 [XA, XM, PA, PE, PC] only	⚠SJP9215	Adaptor	(1)
PACKING PARTS			
P1 [MC, EF]	SPND4	Carton Box	(1)
P1 [Other]	SPND3	Carton Box	(1)
P2	SPSD3	Pad, Front	(1)
P3	SPSD4	Pad, Rear	(1)
P4	XZB45X40A01	Polyethylene Bag, Unit	(1)
P5	SFYF23A35	Polyethylene Bag, Accessories	(1)
P6 [M, MC]	SQWD15	Caution Label	(1)
P6 [Other]	SQWD16	Caution Label	(1)

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ORDER NO. HAD8512319S1

A6

Service Manual

Supplement

COMPACT disc DIGITAL AUDIO

DIGITAL

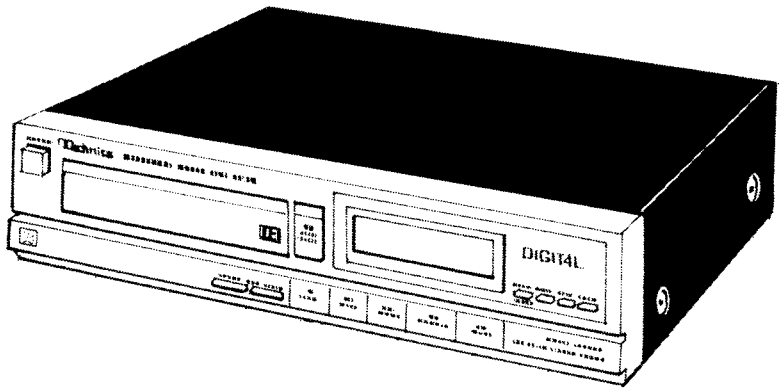
Compact Disc Player

SL-PJ11

Color

(K) .... Black Type

Adjustment Manual



Areas

[M] ..... U.S.A.
[MC] ... Canada
[E] ..... Switzerland and Scandinavia
[EK] .... United Kingdom
[XL] .... Australia
[EG] ... F.R. Germany
[EB] .... Belgium
[EH] .... Holland
[EF] .... France
[Ei] ..... Italy
[EC] .... Czechoslovakia
[XA] .... Southeast Asia, Oceania, Africa, Middle Near East and Central South America
[XM] ... Central South America
[PA] .... Far East PX
[PE] .... European Military
[PC] .... European Audio Club

Please use this manual together with the service manual for Model No. SL-PJ11 Order No. HAD8509264C0.

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Adjustment Manual

1. ADJUSTMENT PROCEDURE

Refer to the service manual for the disassembling methods of each parts.

Note

Avoid the direct entrance of laser rays into the eyes and exposure of the body to laser rays which are dangerous. Especially be carefull in the electric and optical pick-up adjustments because a laser beam is radiated from the lens of the optical pick-up when the power supply of SL-PJ11 is turned on. Also follow the adjusting procedures given in the manual.

1-1. Preparation for Electric Adjustment

① Remove the cabinet.
② Remove the power switch rod.
③ Release the optical pick-up lock by pressing in the lock shaft located on the underside of SL-PJ11 (■ (Lock) → ▬ (Free)).

(Note 1)

The pick-up detects signals recorded on the disc with a laser beam. The pick-up moves as the programs are played back but the movement is not visible from outside.

CAUTION:

- Must remove a disc from the player and lock the pick-up by pressing in the lock shaft when the player is transported as in moving. Otherwise, the disc loading mechanism is moved and damaged.
- Also lock the pick-up by pressing in the lock shaft in (▬→■) prior to disassembling the player.

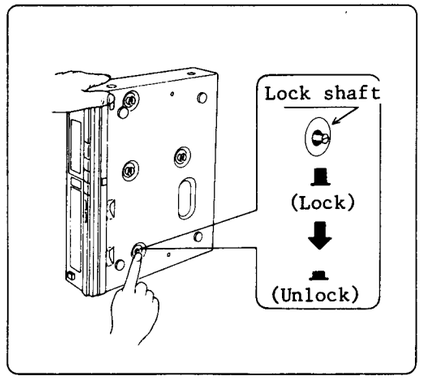
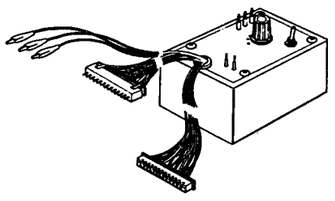


Fig. 1-1 Lock Shaft

1-2. Measuring Instruments and Special Tools

Must provide special tools prior to starting electric adjustment and optical pick-up adjustment. The special tools are available through the ordinary part supply route. Specify the part numbers (SZZP ----) when placing your order.

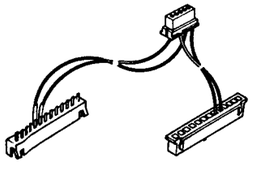
1. Servo gain adjuster (SZZP1017F)



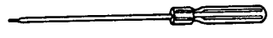
2. Test disc (SZZP1014F)

3. Short lead with clip
4. Ordinary disc
5. 2-channel oscilloscope (with external trigger more than 30MHz)
6. Low frequency oscillator
7. Adjusting screwdriver ----- SZZP1043C
9. Hexagonal wrench----------- SZZP1044C
10. General servicing tools

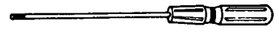
8. Conversion connector (SZZP1032F)



7. Adjusting screwdirver (SZZP1043C)



9. Hexagonal wrench (SZZP1044C)



1-3. Adjusting Point and Test Point Illustration

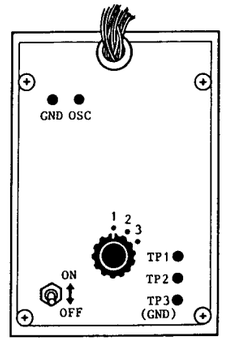


Fig. 1-2 Servo Gain Adjuster

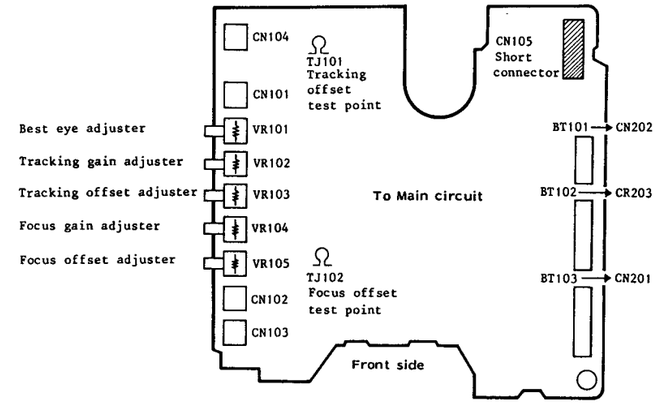


Fig. 1-3 Optical Servo Circuit

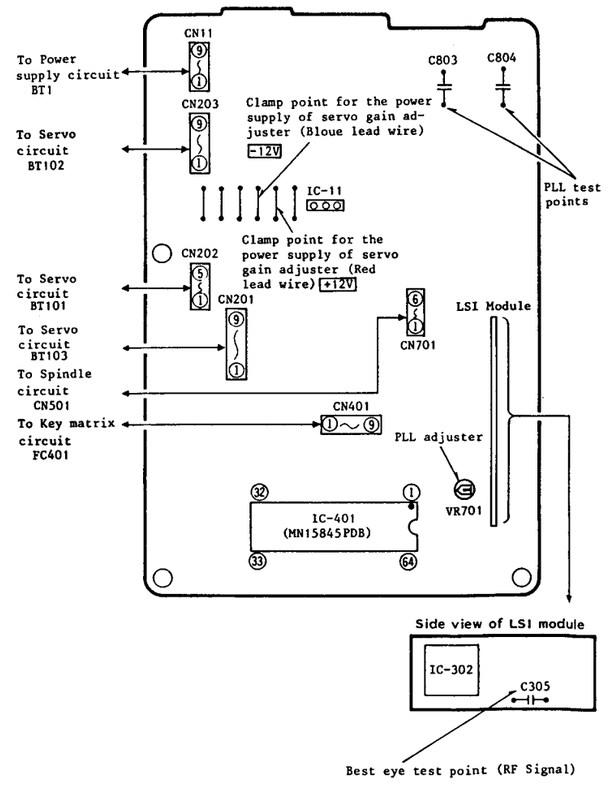


Fig. 1-4 Main Circuit

NOTE:

CN11, CN201, and CN203 are 9-pin connectors. Exercise care when connecting them. If the electric power supply is switched on with any connector connected wrong parts, for instance, IC13, IC14, and IC101 may be damaged.
Pater players employ color connectors for preventing wrong connections.

White connector ⟶ CN11
Pin connector ⟶ CN203
Blue connector ⟶ CN201

1-4. Servo gain adjuster and its connection

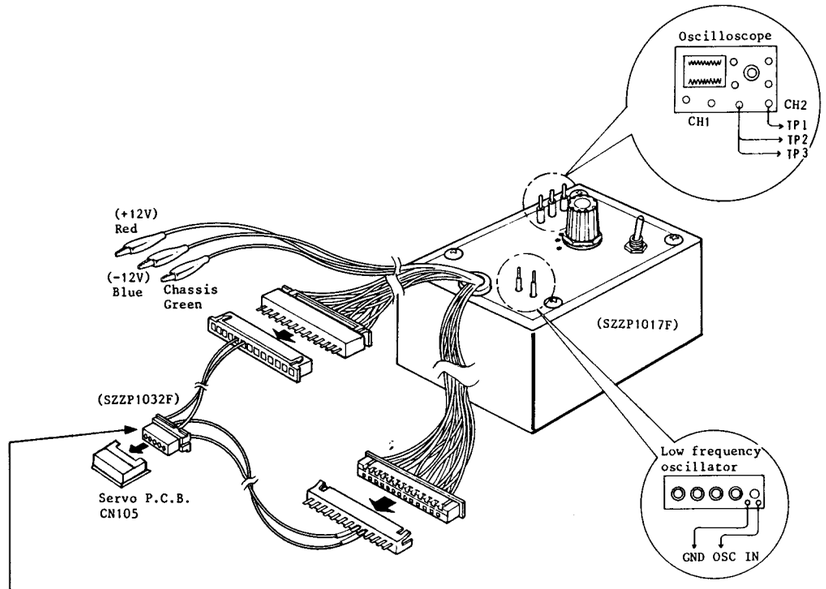


Fig. 1-5 Servo Gain Adjuster

ENGLISH

NOTE:

CN105 of the servo PCB is provided with a short circuiting connector.
Remove the CN105 connector and install the conversion connector (SZZP1032F) for adjustment.
On completion of adjustment, must return the short-circuiting connector to its place.

FRANÇAIS

NOTA:

CN105 de la plaquette à circuits imprimés d'asservissement est muni d'un connecteur de court-circuitage.
Retirer le connecteur CN 105 et installer le connecteur de conversion (SZZP1032F) pour le réglage.
A la fin de la mise au point, on devra remettre à son emplacement le connecteur de court-circuitage.

DEUTSCH

HINWEIS:

CN 105 der Servo-Schaltplatte ist mit einem Kurzschlußschaltstück versehen.
Den CN 105-Steckkontakt abnehmen und während der Einstellung den Konverterstecker (SZZP1032F) anbringen.
Nach vollendeter Einstellung muß das Kurzschlußschaltstück wieder angeschlossen werden.

ESPAÑOL

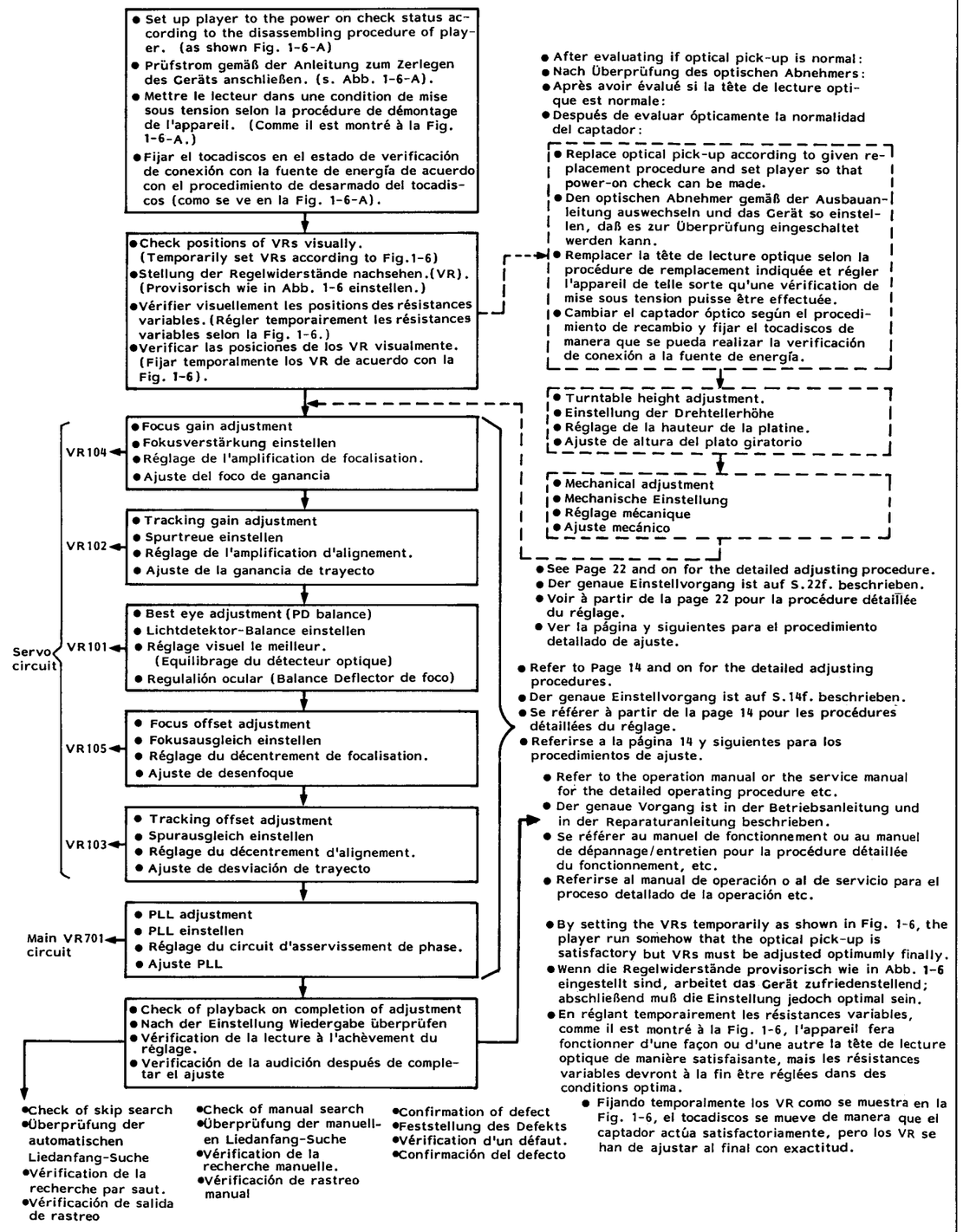
NOTA:

El CN 105 del TCI de servo, está provisto de un conector de cortocircuíto.
Quitar el conector CN105 e instalar el conector de conversión (SZZP1032F) para el ajuste.
Al acabar el ajuste, se tiene que volver a poner el conectador de cortocircuíto en su lugar.

Caution:

(1) Do not look into the lens when power is applied to the unit, since there is laser radiation (H.H.S./D.H.W./etc., regulation).
(2) These steps must be followed in order.

1-5. Electric Adjustment Steps and Points
1-5. Schritte und Vorgänge bei der elektrischen Einstellung
1-5. Points et étapes du réglage électrique
1-5. Pasos y puntos del ajuste eléctrico


● Set up player to the power on check status according to the disassembling procedure of player. (as shown Fig. 1-6-A)
● Prüfstrom gemäß der Anleitung zum Zerlegen des Geräts anschließen. (s. Abb. 1-6-A).
● Mettre le lecteur dans une condition de mise sous tension selon la procédure de démontage de l'appareil. (Comme il est montré à la Fig. 1-6-A.)
● Fijar el tocadiscos en el estado de verificación de conexión con la fuente de energía de acuerdo con el procedimiento de desarmado del tocadiscos (como se ve en la Fig. 1-6-A).
● Check positions of VRs visually. (Temporarily set VRs according to Fig.1-6)
● Stellung der Regelwiderstände nachsehen.(VR). (Provisorisch wie in Abb. 1-6 einstellen.)
● Vérifier visuellement les positions des résistances variables. (Régler temporairement les résistances variables selon la Fig. 1-6.)
● Verificar las posiciones de los VR visualmente. (Fijar temporalmente los VR de acuerdo con la Fig. 1-6).
● After evaluating if optical pick-up is normal:
● Nach Überprüfung des optischen Abnehmers:
● Après avoir évalué si la tête de lecture optique est normale:
● Después de evaluar ópticamente la normalidad del captador:
● Replace optical pick-up according to given replacement procedure and set player so that power-on check can be made.
● Den optischen Abnehmer gemäß der Ausbauanleitung auswechseln und das Gerät so einstellen, daß es zur Überprüfung eingeschaltet werden kann.
● Remplacer la tête de lecture optique selon la procédure de remplacement indiquée et régler l'appareil de telle sorte qu'une vérification de mise sous tension puisse être effectuée.
● Cambiar el captador óptico según el procedimiento de recambio y fijar el tocadiscos de manera que se pueda realizar la verificación de conexión a la fuente de energía.
● Turntable height adjustment.
● Einstellung der Drehtellerhöhe
● Réglage de la hauteur de la platine.
● Ajuste de altura del plato giratorio
● Mechanical adjustment
● Mechanische Einstellung
● Réglage mécanique
● Ajuste mecánico
VR104
● Focus gain adjustment
● Fokusverstärkung einstellen
● Réglage de l'amplification de focalisation.
● Ajuste del foco de ganancia
VR102
● Tracking gain adjustment
● Spurtreue einstellen
● Réglage de l'amplification d'alignement.
● Ajuste de la ganancia de trayecto
Servo circuit
VR101
● Best eye adjustment (PD balance)
● Lichtdetektor-Balance einstellen
● Réglage visuel le meilleur. (Equilibrage du détecteur optique)
● Regulalión ocular (Balance Deflector de foco)
VR105
● Focus offset adjustment
● Fokusausgleich einstellen
● Réglage du décentrement de focalisation.
● Ajuste de desenfoque
VR103
● Tracking offset adjustment
● Spurausgleich einstellen
● Réglage du décentrement d'alignement.
● Ajuste de desviación de trayecto
Main circuit
VR701
● PLL adjustment
● PLL einstellen
● Réglage du circuit d'asservissement de phase.
● Ajuste PLL
● Check of playback on completion of adjustment
● Nach der Einstellung Wiedergabe überprüfen
● Vérification de la lecture à l'achèvement du réglage.
● Verificación de la audición después de completar el ajuste
● See Page 22 and on for the detailed adjusting procedure.
● Der genaue Einstellvorgang ist auf S.22f. beschrieben.
● Voir à partir de la page 22 pour la procédure détaillée du réglage.
● Ver la página y siguientes para el procedimiento detallado de ajuste.
● Refer to Page 14 and on for the detailed adjusting procedures.
● Der genaue Einstellvorgang ist auf S.14f. beschrieben.
● Se référer à partir de la page 14 pour les procédures détaillées du réglage.
● Referirse a la página 14 y siguientes para los procedimientos de ajuste.
● Refer to the operation manual or the service manual for the detailed operating procedure etc.
● Der genaue Vorgang ist in der Betriebsanleitung und in der Reparaturanleitung beschrieben.
● Se référer au manuel de fonctionnement ou au manuel de dépannage/entretien pour la procédure détaillée du fonctionnement, etc.
● Referirse al manual de operación o al de servicio para el proceso detallado de la operación etc.
● By setting the VRs temporarily as shown in Fig. 1-6, the player run somehow that the optical pick-up is satisfactory but VRs must be adjusted optimumly finally.
● Wenn die Regelwiderstände provisorisch wie in Abb. 1-6 eingestellt sind, arbeitet das Gerät zufriedenstellend; abschließend muß die Einstellung jedoch optimal sein.
● En réglant temporairement les résistances variables, comme il est montré à la Fig. 1-6, l'appareil fera fonctionner d'une façon ou d'une autre la tête de lecture optique de manière satisfaisante, mais les résistances variables devront à la fin être réglées dans des conditions optima.
● Fijando temporalmente los VR como se muestra en la Fig. 1-6, el tocadiscos se mueve de manera que el captador actúa satisfactoriamente, pero los VR se han de ajustar al final con exactitud.
●Check of skip search
●Überprüfung der automatischen Liedanfang-Suche
●Vérification de la recherche par saut.
●Verificación de salida de rastreo
●Check of manual search
●Überprüfung der manuellen Liedanfang-Suche
●Vérification de la recherche manuelle.
●Verificación de rastreo manual
●Confirmation of defect
●Feststellung des Defekts
●Vérification d'un défaut.
●Confirmación del defecto

1-6. Initial Setting Points of Adjusting Variable Resistors (VR)

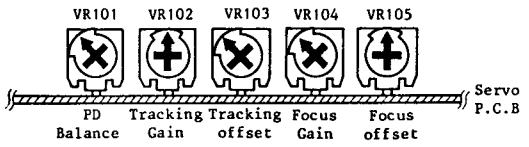


Fig. 1-6 Temporarily Set VRs

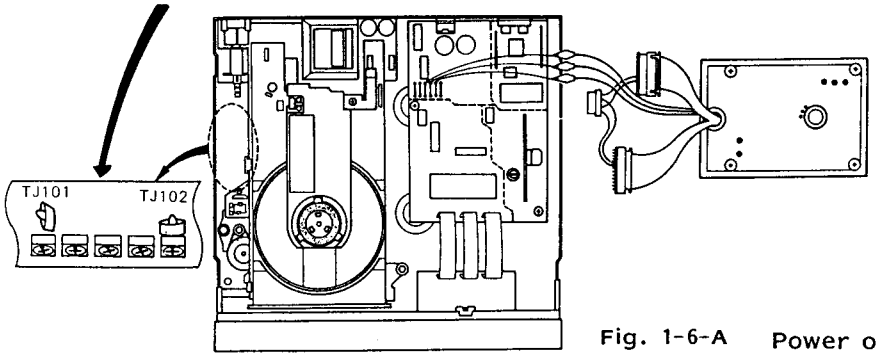


Fig. 1-6-A Power on check status

ENGLISH

- Adjusting Variable Resistors and Test Points

The player operates but not optimum at the above settings of the adjusting variable resistors. Adjust them according to the adjusting procedure.

Must conduct the electric adjustment when any electric part is replaced. Perform ① optical pick-up adjustment and ②electric adjustment in the stated order when the optical pick-up (SOAD 20A) is replaced.

Arrangement of the adjusting variable resistors viewing the side face. All the electric adjustments are possible by setting as shown in Fig. 1-6.
(Removed the power supply switch rod for the convenience of adjustment.)

DEUTSCH

- Einstellung der Regelwiderstände und der Prüfkontakte

Bei der oben dargestellten Stellung der Regelwiderstände funktioniert das Gerät, aber nicht optimal. Gemäß dem Einstellvorgang einstellen.

Die elektrische Einstellung muß immer durchgeführt werden, wenn ein elektrisches Teil ausgewechselt wird. Bei Auswechseln des optischen Abnehmers immer ① die Einstellung des optischen Abnehmers und ② elektrische Einstellung in dieser Reihenfolge durchführen. (Optischer Abnehmer = SO AD 20A)

Die Regelwiderstände an der Seitenfläche können alle wie in Abb. 1-6 eingestellt werden. (Um die Arbeit bei der Einstellung zu erleichtern, kann der Schaltstab des Netzschalters abgenommen werden.)

FRANÇAIS

- Réglage des résistances variables et des points de mesure L'appareil fonctionne, mais non dans les conditions optima des réglages ci-dessus des résistances variables d'ajustement. Les régler selon la procédure d'ajustement.

On devra réaliser un réglage électrique lorsque n'importe quel élément électrique est remplacé. Effectuer ①le réglage de la tête de lecture optique et ②le réglage électrique dans l'ordre indiqué lorsque la tête de lecture optique (SOAD20A) est remplacée.

Disposition des résistances variables d'ajustement en regardant le face latérale. Toutes les mises au point électriques sont possibles en réglant comme il est montré à la Fig. 1-6.
(Retirer la tige d'attaque de l'interrupteur d'alimentation pour la commodité de l'ajustement.)

ESPAÑOL

- Ajuste de las resistencias variables y puntos de prueba

El tacadiscos funciona pero no muy bien en la condición de ajuste de las resistencias variables. Ajustarlas según el procedimiento de ajuste.

Se tiene que hacer un ajuste cuando se cambia cualgriser pieza eléctrica. Hacer ①primero el ajuste del colector óptico y luego②el ajuste eléctrico en el orden debido cuando se cambie el colector óptico (SOAD20A)

La distribución de las resistencias variables de la cara lateral. Es posible hacer todos las ajustes eléctricos haciendo la fijación tal como indica la Fig. 1-6-A.
(Quitar la varilla del interruptor de la fuente de energía para hacer más fácilmente el ajuste.)

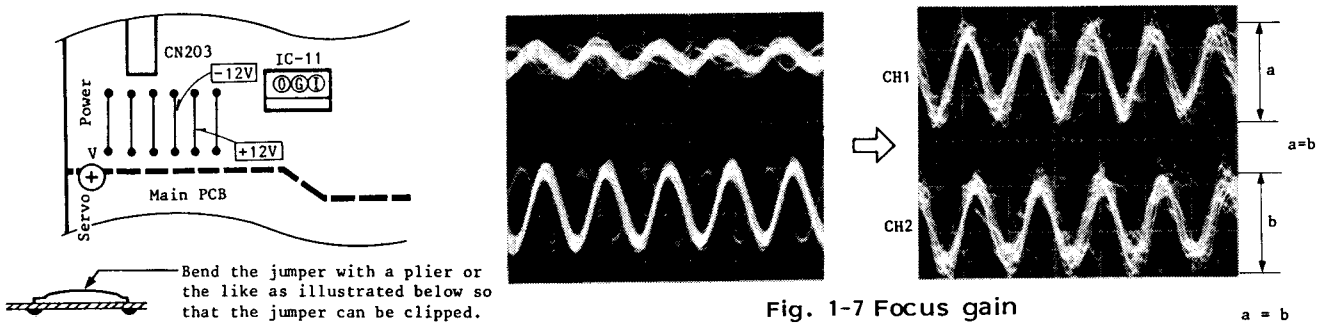


Fig. 1-7 Focus gain

ENGLISH A. Focus Gain Adjustment

(1) Connect the servo gain adjuster (SZZP1017F) with conversion connector (SZZP1032F) to the player as shown in Fig. 1-5.

Connecting points -
- Red lead: Jumper (+12 V) beside the IC11 terminals on the main PCB
- Blue lead: Jumper (-12 V) beside the IC11 terminals on the main'PCB
- Green lead: Chassis
- Connector: Remove the short-circuiting pin of CN105 on the servo PCB and connect the conversion connector (SZZP1032F). Connect the conversion connector side (5 pins) to CN105.

(2) Set the low frequency oscillator to a frequency 750 Hz and an output voltage of 150 mV_{p-p} then connect the oscillator to the terminals OSC IN and GND of the servo gain adjuster (SZZP1017F).

(3) Connect CH-1 and CH-2 of the oscilloscope to TP1 and TP2 of the Servo gain adjuster (SZZP1017F). (TP3 is the grounding terminal.)

Oscilloscope setting --
- Volt ..... 100 mV
- Sweep ..... 1 ms
- Input selector ..... DC

(4) Turn on the power supply switch of the player.

(5) Place the test disc (SZZP1014F) in to the disc holder by open/close key and in the Playback mode.

(6) Set the rotary switch of the servo gain adjuster (SZZP1017F) to "2"→"3" and the on/off switch to "ON" position.

(7) The player to the Play mode and the 750 Hz signal will be displayed on the oscilloscope, then adjust VR104 so that the waveforms and amplitudes of the both channels shall be equal as shown in Fig. 1-7.

(8) Turn off the power supply switch of the player.

DEUTSCH A. Einstellung der Fokusverstärkung

(1) Den Servo- Verstärkungsregler (SZZP1017F) wie in Abb. 1-5 mit dem Konverterstecker (SZZP1032F) an das Gerät anschließen.

Kontakte -
- Rote Leitung: Schaltdraht (+12V) neben den IC11-Klemmen auf der Haupt-Schaltplatte
- Blaue Leitung: Schaltdraht (-12V) neben den IC11-Klemmen auf der Haupt-Schaltplatte
- Grüne Leitung: Gehäuse
- Stecker: Den Kurzschlußkontakt von CN105 auf der Servo-Schaltplatte abnehmen und den Konverterstecker anbringen (SZZP1032F). Die Anschlußseite des Konvertersteckers (5 Kontakte) an CN105 anbringen.

(2) Auf dem Niederfrequenz-Oszillator eine Frequenz von 750 Hz und Ausgangsspannung von 150mVp-p einstellen, dann den Oszillator an die Klemmen OSC IN und GND des Servo-Verstärkungsreglers anschließen (SZZP1017F).

(3) CH-1 und CH-2 des Oszilloskops an TP1 und TP2 des Servoverstärkungsreglers (SZZP1017F) anbringen. (TP3 ist die Erdungsklemme.)

Einstellung des Oszilloskops:
- Spannung ..... 100 mV
- Ablenkung ..... 1 ms
- Eingangsumschalter ..... Gleichstrom

(4) Die Stromversorgung des Geräts einschalten.

(5) Mit dem Schalter open/close den Testdisk (SZZP1014F) einlegen und auf Wiedergabe schalten.
(6) Den Schaltknopf des Servo-Verstärkungsreglers (SZZP1017F) auf "2" → "3" und den on/off-Schalter auf "ON" stellen.
(7) Wenn das Gerät auf Wiedergabe läuft und das 750Hz-Signal auf dem Oszilloskop angezeigt wird, VR 104 so einstellen, daß die Kurven und Amplitüden der beiden Kanäle wie in der Abb. 1-7 gleich sind.
(8) Die Stromversorgung des Geräts abschalten.

FRANÇAIS A. Réglage de l'amplification de focalisation

(1) Raccorder l'ajusteur d'amplification asservie (SZZP1017F) avec le connecteur de conversion (SZZP1032F) au lecteur, tel qu'il est montré à la Fig. 1-5.

Points de raccordement --
- Fil rouge : Jarretière (+12V) à côté des bornes IC11 sur la plaquette à circuits imprimés principale.
- Fil bleu : Jarretière (-12V) à côté des bornes IC11 sur la plaquette à circuits imprimés principale.
- Fil vert : Châssis
- Connecteur : Retirer la broche de court-circuitage de CN105 sur la plaquette de circuits imprimés d'asservissement et raccorder le connecteur de conversion (SZZP1032F). Raccorder le côté du connecteur de conversion (5 broches) à CN 105.

(2) Régler l'oscillateur de basses fréquences sur une fréquence de 750 Hz et une tension de sortie de 150 mV crête-à-crête, puis brancher l'oscillateur aux bornes OSC IN (entrée d'oscillateur) et GND (terre) de l'ajusteur d'amplification asservie (SZZP1017F).
(3) Raccorder le canal 1 et le canal 2 de l'oscilloscope à TP1 et TP2 de l'ajusteur d'amplification asservie (SZZP1017F). (TP3 est la borne de mise à la terre.)

Réglages de l'oscilloscope
- Tension ..... 100 mV
- Balayage ..... 1 ms
- Sélecteur d'entrée ... C.C.

(4) Mettre en marche l'interrupteur d'alimentation du lecteur.
(5) Installer le disque d'essai (SZZP1014F) dans le dispositif de support pour disque en utilisant la touche d'ouverture/fermeture et régler sur le mode de lecture.
(6) Régler le commutateur rotatif de l'ajusteur d'amplification asservie (SZZP1017F) sur "2" → "3" et le commutateur de marche/arrêt sur la position "ON" (marche).
(7) Régler le lecteur sur le mode d'audition et le signal de 750 Hz sera affiché sur l'oscilloscope. Puis, régler VR104 de telle sorte que les formes d'ondes et les amplitudes des deux canaux deviennent égales, comme il est montré à la Fig. 1-7.
(8) Mettre hors circuit l'interrupteur d'alimentation en courant du lecteur.

ESPAÑOL A. Ajuste de ganancia de foco

(1) Conectar el ajustador de ganancia de servo (SZZP1017F) con el conectador de conversión (SZZP1032F) al tocadiscos, como muestra la Fig. 1-5.

Puntos de conexión -
- Hilo rojo — Puente (+12V): junto a los terminales CI11 de la TCI principal
- Hilo rojo — Puente (-12V): junto a los terminales CI11 de la TCI principal
- Hilo verde: Chasis
- Conector: Quitar la clavija de cortocircuíto de CN 105 en la TCI de servo y empalmar el conector de conversión (SZZP1032F). Conectar el lado del conector de conversión (de 5 espigas) con CN105.

(2) Fijar el oscilador de baja frecuencia a una frecuencia de 750 Hz y un voltaje de potencia de salida de 150 mV_{p-p} y luego conectar el oscilador a los terminales OSC IN y TIERRA del ajustador de ganancia de servo (SZZP1017F).
(3) Conectar el CANAL-1 y el CANAL-2 al osciloscopio al TP1 y TP2 del ajustador de ganancia de servo (SZZP1017F).

Fijación del osciloscopio --
- Voltaje ..... 100 mV
- Barrido ..... 1 ms
- Selector de potencia de enrada ..... CD

(4) Encender el interruptor de la fuente de energía del tocadiscos.
(5) Poner la disqueta de prueba (SZZP1014F) en su soporte con la llave de abierto/cerrado y en el modo de audición.
(6) Fijar el interruptor rotativo del ajustador de ganancia de servo (SZZP1017F) en "2" → "3" y en posición "ENCENDIDO".
(7) En el osciloscopio se mostrarán el modo de audición del tocadiscos y la señal de 750 Hz, después de lo cual hay que ajustar VR 104 de manera que las formas de onda y las amplitudes de ambos canales sean iguales a las que se muestran en la Fig. 1-7.
(8) Apagar el interruptor de la fuente de anergía del tocadiscos.

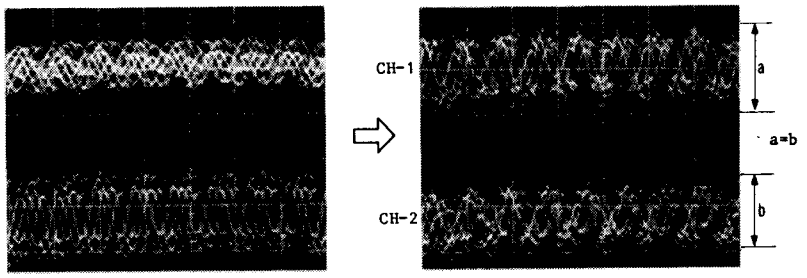


Fig. 1-8 Tracking gain

B. Tracking Gain Adjustment

(1) Set the low frequency oscillator to a frequency of 1.2 kHz and an output of 150 mVp-p, and connect the oscillator to the OSC IN and GND of the gain adjuster (SZZP1017F).

(2) Connect the CH-1 and CH-2 of the oscilloscope to the TP1 and TP2 of the gain adjuster (SZZP1017F). (TP3 is a grounding terminal.)

Oscilloscope setting:
- Volt : 100 mV
- Sweep : 0.5 ms
- Input selector: DC

(3) Turn on the power supply switch of the Player.

(4) Place the test disc (SZZP1014F) in to the disc holder by open/close key and in the Playback mode.

(5) Set the rotary switch of the servo gain adjuster (SZZP1017F) to "2" → "1" and the on/off switch to "ON" position.

(6) Set the player to the play mode and the 1.2 kHz signal will be displayed on the oscilloscope, then adjust VR102 so that the waveforms and amplitudes of the both channels shall be equal as shown in Fig. 1-8.

(7) Turn off the power supply switch of the player.

(8) After completing the above mentioned adjustment, remove the servo gain adjuster and insert the shorting connector into CN105 as it was.

B. Einstellung der Spurtreue

(1) Den Niederfrequenz-Oszillator auf eine Frequenz von 1,2kHz und einen Ausgangswert von 150mVp-p einstellen und an OSC IN und GND des Verstärkungsreglers (SZZP1017F) anschließen.

(2) CH-1 und CH-2 des Oszilloskops an die Klemmen TP1 und TP2 des Verstärkungsreglers (SZZP1017F) anschließen. (TP3 ist eine Erdungsklemme).

Einstellung des Oszilloskops:
- Spannung 100mV
- Ablenkung 0,5ms
- Eingangsumschalter ..... Gleichstrom

(3) Die Stromversorgung des Geräts einschalten.

(4) Mit dem open/close-Schalter den Testdisk (SZZP1014F) einlegen und das Gerät auf Wiedergabe stellen.

(5) Den Schaltknopf des Servo-Verstärkungsreglers (SZZP1017F) auf "2" → und den on/off-Schalter auf "ON" stellen.

(6) Wenn das Gerät auf Wiedergabe steht und auf dem Oszilloskop das 1,2kHz-Signal dargestellt wird, muß VR102 so eingestellt werden, daß die Kurven und Amplitüden auf beiden Kanälen wie in Abb. 1-8 gleich sind.

(7) Die Stromzufuhr zum Gerät abschalten.

(8) Nach beendigter Einstellung den Servo-Verstärkungsregler entfernen und das Kurzschlußschaltstück wie zu Anfang an CN 105 anbringen.

B. Réglage de l'amplification d'alignement

(1) Régler l'oscillateur de basses fréquences sur une fréquence de 1,2 kHz et une tension de sortie de 150 mV crête-à-crête, puis brancher l'oscillateur aux bornes OSC IN (entrée d'oscillateur) et GND (terre) de l'ajusteur d'amplification asservie (SZZP1017F).
(2) Raccorder le canal 1 et le canal 2 de l'oscilloscope à TP1 et TP2 de l'ajusteur d'amplification asservie (SZZP1017F). (TP3 est la borne de mise à la terre.)

Réglages de l'oscilloscope --
- Tension ..... 100 mV
- Balayage ..... 0,5 ms
- Sélecteur d'entrée ... C.C.

(3) Mettre en marche l'interrupteur d'alimentation du lecteur.
(4) Installer le disque d'essai (SZZP1014F) dans le dispositif de support pour disque en utilisant la touche d'ouverture/fermeture et régler sur le mode de lecture.
(5) Régler le commutateur rotatif de l'ajusteur d'amplification asservie (SZZP1017F) sur "2" → "1" et le commutateur de marche/arrêt sur la position "ON" (marche).
(6) Régler le lecteur sur le mode d'audition et le signal de 1,2 kHz sera indiqué sur l'oscilloscope. Puis, régler VR102 de telle sorte que les formes d'ondes et les amplitudes des deux canaux soient égales, comme il est montré à la Fig. 1-8.
(7) Mettre hors circuit l'interrupteur d'alimentation du lecteur.
(8) Une fois achevé le réglage mentionné ci-dessus, retirer l'ajusteur d'amplification asservie et insérer le connecteur de court-circuitage dans CN105 comme il l'était auparavant.

B. Ajuste de gancia de trayectoria

(1) Ajustar el oscilador de baja frecuencia a la frecuencia de 1:2kHz y una potencia de salida de 150mV$_{p-p}$, y conectar el oscilador a OSC IN y TIERRA del ajustador de ganancia (SZZP1017F).
(2) Conectar el CANAL-1 y el CANAL-2 del osciloscopio a TP1 y TP2 del ajustador de ganancia (SZZP1017F). (TP3 es un terminal de tierra.)

Fijación del osciloscopio --
- Voltaje ..... 100 mV
- Barrido ..... 0,5 ms
- Selector de potencia de entrada..... CD

(3) Encender el interruptor de fuente de energía del tocadiscos.
(4) Poner la disqueta de prueba (SZZP1014F) en su soporte por medio de la llave de abierto/cerrado y en el modo de audición.
(5) Fijar el interruptor rotativo del ajustador de ganancia de servo (SZZP1017F) en "2" → "1" y el interruptor de encendido/apagado en la posición de "Encendido".
(6) En el osciloscopio se tiene que mostrar el tocadiscos en el modo de audición y la señal de 1.2 kHz, ajustando VR102 de manera que las formas de onda y amplitudes de ambos canales sean iguales a las que se ven en las Fig.1-8.
(7) Apagar el interruptor de fuente de energía del tocadiscos.
(8) Después de completar los referidos ajustes, quitar el ajustador de ganancia de servo e insertar el conectador de cortocircuíto en CN105 como estaba antes.

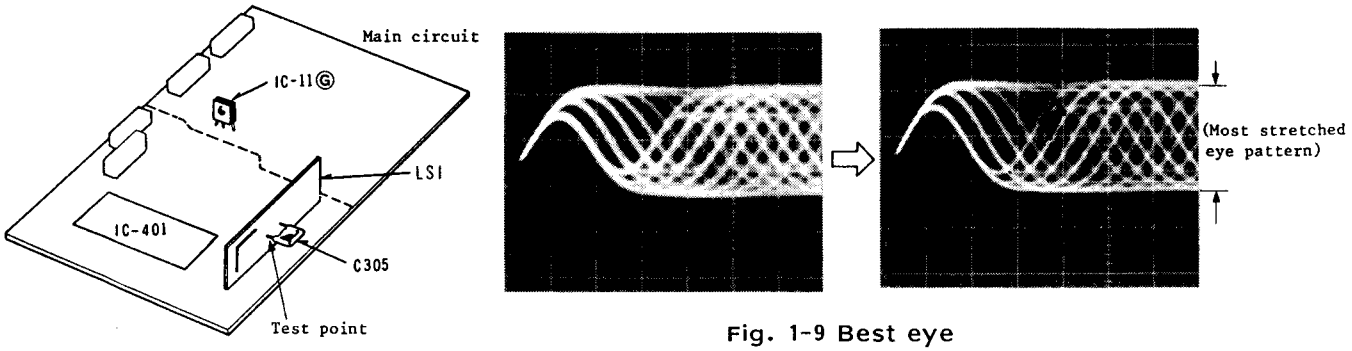


Fig. 1-9 Best eye

C. Best Eye (PD Balance) Adjustment

(1) Connect CH-1 of the oscilloscope to the terminal C305 (either right or left legs) on the LSI module PCB and the grounding terminal of IC-11 Ⓖ.

Oscilloscope setting ---
- Volt : 500 mV
- Sweep : 0.5 µsec
- Input : AC

(2) Turn on the power supply switch of the player.

(3) Place the test disc (SZZP1014F) in to the disc holder by open/close key.

(4) The player to the play mode.

(5) Play TR8 or 13 (BS 0.5 mm) of the test disc (SZZP1014F).

(6) Adjust VR101 so that the eye pattern of RF signal is stretched most as shown in Fig. 1-9.

(7) Turn off the power supply switch of the player.

C. Einstellung der Lichtdetektor-Balance (Best Eye)

(1) CH-1 des Oszilloskops (links oder rechts) an die Klemme C305 des LSI-Modul-Steckkontakts und an die Erdungsklemme von IC-11Ⓖ anschließen.

Einstellung des Oszilloskops ---
- Spannung : 500 mV
- Ablenkung : 0,5 µs
- Eingang : Wechselstrom

(2) Die Stromversorgung des Geräts einschalten.
(3) Mit dem open/close-Schalter den Testdisk (SZZP1014F) einlegen.
(4) Das Gerät auf Wiedergabe stellen.
(5) TR 8 oder 13 auf dem Testdisk (SZZP1014) abspielen (BS 0,5mm).
(6) VR101 so einstellen, daß das Augenmuster des Signals so gedehnt wie möglich, wie in Abb. 1-9, erscheint.
(7) Die Stromzufuhr zum Gerät abschalten.

C. Réglage visuel le meilleur (Equilibrage du détecteur optique)

(1) Raccorder le canal 1 de l'oscilloscope à la borne C305 (aux branches de droite ou de gauche) sur la plaquette à circuits imprimés du module de l'intégration à grande échelle (LSI) et la borne de mise à la terre de IC-11Ⓖ.

Réglages de l'oscilloscope
- Tension ..... 500 mV
- Balayage ..... 0,5 µsec.
- Sélecteur d'entrée ... C.A.

(2) Mettre en marche l'interrupteur d'alimentation du lecteur.
(3) Installer le disque d'essai (SZZP1014F) dans le dispositif de support pour disque en utilisant la touche d'ouverture/fermeture.
(4) Régler le lecteur sur le mode d'audition.
(5) Faire jouer la piste 8 ou 13 (zone d'interférence de 0,5 mm) du disque d'essai (SZZP1014F).
(6) Régler VR101 de telle sorte que l'oscillogramme visuel du signal de haute fréquence soit le plus étiré possible, comme il est montré à la Fig. 1-9.
(7) Mettre hors circuit l'interrupteur d'alimentation du lecteur.

C. Ajuste ocular mejor (Balance del detector óptico)

(1) Conectar el CANAL-1 del osciloscopio al terminal C305 (tanto los bornes derechos como los izquierdos) del módulo LSI de la TCI y al terminal de tierra de CI-11 Ⓖ.

Fijación del osciloscopio ---
- Voltaje : 500mV
- Barrido : 0,5 µseg
- Potencia de entrada : CA

(2) Encender el interruptor de la fuente de energía del tocadiscos.
(3) Poner la disqueta de prueba (SZZP1014F) en su soporte con la llave de abierto/cerrado.
(4) El todadiscos en el modo de audición.
(5) Escuchar la pista 8 ó 13 (Punto negro 0,5mm) en la disqueta (SZZP1014F).
(6) Ajustar VR101 de manera que el módulo ocular de la señal RF sea de lo más alargado, como se muestra en la figura.
(7) Apagar el interruptor de fuente de energía del tocadiscos.

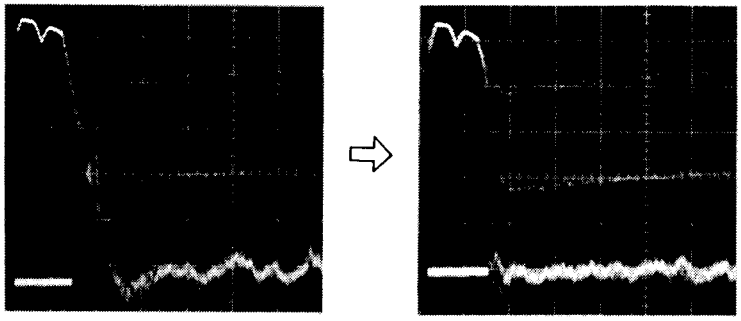


Fig. 1-10. Focus offset

D. Focus Offset Adjustment

(1) Connect CH-1 of the oscilloscope to the terminal C305 (either right or left legs) on the LSI Modul PCB, and CH-2 to the terminal TJ102 (Focus offset Test Point) on the Servo PCB.
Connect GND of the oscilloscope to the IC-11 Ground Point on the Main PCB.

Oscilloscope setting	C305 (CH-1)	TJ102 (CH-2)
Volt	: 500mV	100mV
Sweep	: 0.5 msec.	
Input Selector	: AC	DC
Mode	: NORM (Triggering Via CH-1).	

(2) Turn on the power supply switch of the player.
(3) Place the test disc (SZZP1014F) in to the disc holder by open/close key.
(4) The player to the play mode.
(5) Play TR8 or 13 (BS 0.5 mm) of the test disc (SZZP1014F).
(6) Check the waveforms of CH-1 and CH-2 on the oscilloscope and adjust VR105 so that the waveform around the triggering point shall be as illustrated Fig. 1-10.
(7) Turn off the power supply switch of the player.

D. Einstellung des Fokusausgleichs

(1) CH-1 des Oszilloskops (links oder rechts) an die Klemme C 305 der LSI-Modul-Schaltplatte und CH-2 an die Klemme TJ 102 (Fokusausgleich-Testklemme) an der Servo-Schaltplatte anschließen.
GND des Oszilloskops an den Erdungskontakt IC-11 der Haupt-Schaltplatte anschließen.

Einstellung des Oszilloskops	C305(CH-1)	TJ102 (CH-2)
Spannung	: 500mV	100mV
Ablenkung	: 0,5 msec.	
Eingangsumschalter	: Wechselstrom	Gleichstrom
Betriebsart	: NORM (Auslösung über CH-1)	

(2) Die Stromversorgung des Geräts einschalten.
(3) Mit dem open/close-Schalter den Testdisk (SZZP1014F) einlegen.
(4) Das Gerät auf Wiedergabe stellen.
(5) TR8 oder 13 (BS 0,5mm) des Testdisks (SZZP1014F) abspielen.
(6) Signalformen von CH-1 und CH-2 auf dem Oszilloskop überprüfen und VR 105 so einstellen, daß die Signalform um den Auslösepunkt wie in Abb. 1-10 aussieht.
(7) Die Stromzufuhr zum Gerät abschalten.

D. Réglage du décentrement de focalisation

(1) Raccorder le canal 1 de l'oscilloscope à la borne C305 (aux branches de droite ou de gauche) sur la plaquette à circuits imprimés du module de l'intégration à grande échelle, et le canal 2 à la borne TJ102 (point d'essai du décentrement de focalisation) sur la plaquette à circuits imprimés d'asservissement.
Raccorder GND (terre) de l'oscilloscope au point de mise à la terre IC-11 sur la plaquette à circuits imprimés principale.

Réglages de l'oscilloscope		C305 (Canal 1)	TJ102 (Canal 2)
	Tension	: 500 mV	100 mV
	Balayage	: 0,5 msec.	
	Sélecteur d'entrée	: C.A.	C.C.
	Mode	: NORM (Déclenchement via le canal 1)	

(2) Mettre en marche l'interrupteur d'alimentation du lecteur.
(3) Installer le disque d'essai (SZZP1014F) dans le dispositif de support pour disque en utilisant la touche d'ouverture/fermeture.
(4) Régler le lecteur sur le mode d'audition.
(5) Faire jouer la piste 8 ou 13 (zone d'interférence de 0,5mm) du disque d'essai (SZZP1014F).
(6) Vérifier les formes d'ondes du canal 1 et du canal 2 sur l'oscilloscope et régler VR105 de telle sorte que la forme d'onde autour de point de déclenchement soit telle qu'elle est illustrée à la Fig. 1-10.
(7) Mettre hors circuit l'interrupteur d'alimentation du lecteur.

D. Ajuste del desenfoque

(1) Conectar el CANAL-1 al terminal del osciloscopio C305 (tanto los bornes de la derecha como los de la izquierda) en el módulo LSI de la TCI, y el CANAL-2 al terminal TJ102 (Punto de prueba de desenfoque) de la TCI de servo.
Conectar TIERRA del osciloscopio al CI-11 del punto de tierra de la TCI principal.

Fijación del osciloscopio		C305(CANAL-1)	TJ102 (CANAL-2)
	Voltaje	: 500mV	100mV
	Barrido	: 0,5 msg.	
	Selector de potencia de entrada	: CA	CD
	Modo	: NORM (Disparo vía CANAL-1)	

(2) Encender el interruptor de fuente de energía del tocadiscos.
(3) Poner la disqueta de prueba (SZZP1014F) en su soporte con la llave de abierto/cerrado.
(4) El tocadiscos en el modo de audición.
(5) Tocar TR8 ó 13 (BS 0,5mm) del disco de prueba (SZZP1014F).
(6) Verificar las formas de onda del CANAL-1 y el CANAL-2 en el osciloscopio y ajustar VR105 de manera que la forma de onda alrededor del punto de disparo sea como muestra las Fig. 1-10.
(7) Apagar el interruptor de la fuente de energía del tocadiscos.

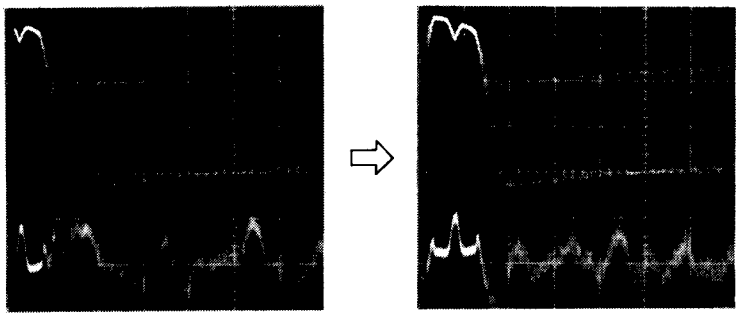


Fig. 1-11 Tracking offset

E. Tracking Offset Adjustment

(1) Connect CH-1 of the oscilloscope to the terminal C305 (either right or left legs) on the LSI module PCB and CH-2 to the terminal TJ101 (Tracking offset test point) on the Servo PCB.
Connect GND of the oscilloscope to the IC-11 ground point of the main PCB.

Oscilloscope Setting		C305 (CH-1)	TJ101 (CH-2)
	Volt	: 500 mV	100mV
	Sweep	: 0.5 msec.	
	Input selector	: AC	DC
	Mode	: NORM (Triggering Via CH-1)	

(2) Turn on the power supply switch of the player.

(3) Place the test disc (SZZP1014F) in to the disc holder by open/close key.

(4) The player to the play mode.

(5) Play TR8 or 13 of the test disc (SZZP1014F).

(6) Check CH-1 and CH-2 waveforms displayed on the oscilloscope and adjust VR103 so that the waveforms shall be as illustrated Fig. 1-11.

(7) Turn off the power supply switch of the player.

E. Einstellung des Spurausgleichs

(1) CH-1 des Oszilloskops (rechts oder links) an die Klemme 305 der LSI-Modul-Schaltplatte und CH-2 an die Klemme TJ 101 (Spurausgleich-Prüfkontakt) der Servo-Schaltplatte anschließen. GND des Oszilloskops an die Erdungsklemme IC-11 der Haupt-Schaltplatte anschließen.

Einstellung des Oszilloskops	C305(CH-1)	
Spannung	: 500 mV	100mV
Ablenkung	: 0,5 msec.	
Eingangsumschalter	: Wechselstrom	Gleichstrom
Betriebsart	: NORM (Auslösung über CH-1)	

(2) Stromversorgung des Geräts einschalten.
(3) Mit dem open/close-Schalter den Testdisk (SZZP1014F) in das Gerät einlegen.
(4) Das Gerät auf Wiedergabe stellen.
(5) TR8 oder 13 auf dem Testdisk abspielen.
(6) Die Signalformen von CH-1 und CH-2 auf dem Oszilloskop überprüfen und VR 103 so einstellen, daß sie wie in der Abb. 1-11 aussehen.
(7) Stromzufuhr zum Gerät abschalten.

E. Réglage du décentrement d'alignement

(1) Raccorder le canal 1 de l'oscilloscope à la borne C305 (aux branches de droite ou de gauche) sur la plaquette à circuits imprimés du module de l'intégration à grande échelle et le canal 2 à la borne TJ101 (point d'essai du décentrement d'alignement) sur la plaquette à circuits imprimés d'asservissement.
Raccorder GND (mise à la terre) de l'oscilloscope au point de mise à la terre IC-11 de la plaquette à circuits imprimés principale.

Réglages de l'oscilloscope	C305 (Canal 1)	TJ101 (Canal 2)
Tension	: 500 mV	100 mV
Balayage	: 0,5 msec.	
Sélecteur d'entrée	: C.A.	C.C.
Mode	: NORM (Déclenchement via la canal 1)	

(2) Mettre en marche l'interrupteur d'alimentation du lecteur.
(3) Installer le disque d'essai (SZZP1014F) dans le dispositif de support pour disque en utilisant la touche d'ouverture/fermeture.
(4) Régler le lecteur sur le mode d'audition.
(5) Faire jouer la piste 8 ou 13 du disque d'essai (SZZP1014F).
(6) Vérifier les formes d'ondes du canal 1 et du canal 2 affichées sur l'oscilloscope et régler VR103 de telle que les formes d'ondes soient telles qu'elles sont illustrées à la Fig. 1-11.
(7) Mettre hors circuit l'interrupteur d'alimentation du lecteur.

E. Ajuste del desvío de trayectoria

(1) Conectar el CANAL-1 del osciloscopio al terminal C305 (tanto los bornes de la derecha como los de la izquierda) en el módulo LSI de la TCI y el CANAL-2 al terminal TJ101 (Punto de prueba del desvío de trayectoria) en la TCI de servo.
Conectar TIERRA del osciloscopio al punto de tierra CI-11 de la TCI principal.

Fijación del osciloscopio	C305 (CANAL-1)	TJ101 (CANAL-2)
Voltaje	: 400mV	100mV
Barrido	: 0,5msg.	
Selector de potencia de entrada	: CA	CD
Modo	: NORMA (Disparo vía CANAL-1)	

(2) Encender el interruptor de fuente de energía del tocadiscos.
(3) Poner la disqueta de prueba (SZZP1014F) en su soporte por medio de la llave de abierto/cerrado.
(4) El tocadiscos en el modo de audición.
(5) Tocar la pista 8 ó 13 de la disqueta de prueba (SZZP1014F).
(6) Verificar las formas de onda del CANAL-1 y CANAL-2 que se muestran en el osciloscopio y ajustar VR103 de manera que las formas de onda sean como las de la Fig. 1-11.
(7) Apagar el interruptor de fuente de energía del tocadiscos.

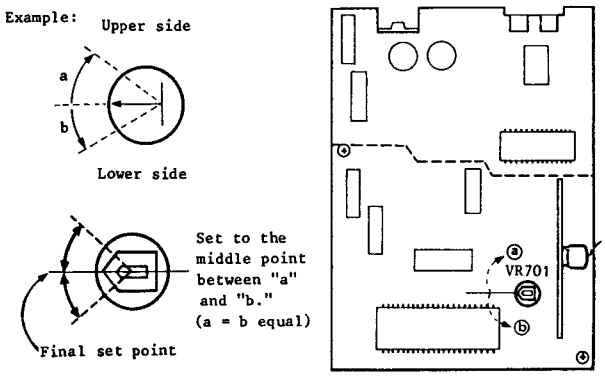


Fig. 1-12 Adjust point

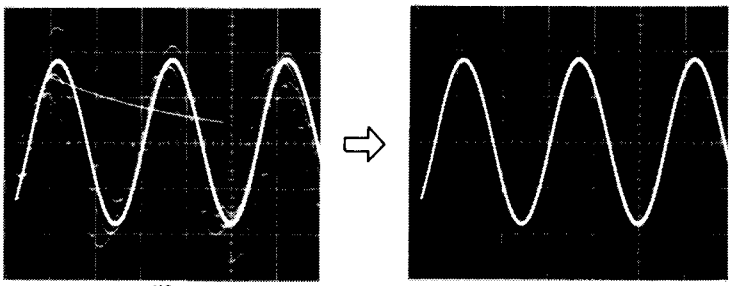


Fig. 1-13 PLL

F. PLL Adjustment

(1) Connect CH-1 of the oscilloscope to the terminal C803 (either of right and left legs) of the main PCB and the terminal GND of the chassis.

Oscilloscope setting---
- Volt : 1.0 V
- Sweep : 1 msec.
- Input selector : DC

(2) Turn on the power supply switch of the player.

(3) Place the test disc (SZZP1014F) in to the disc holder by open/close key.

(4) The player to the play mode.

(5) Play TR8 or 13 (BS 0.5 mm) of the test disc (SZZP1014F).

(6) Check the waveform displayed on the oscilloscope and adjust VR701 in the following steps.

ⓐ Turn VR701 upwards slowly and learn the point at which the waveform on the oscilloscope begins to be disturbed as shown Fig. 1-13 NG.

ⓑ Turn VR701 downwards slowly (opposite direction to that in the above para. "a") and learn the point at which the waveform on the oscilloscope begins to be disturbed.

ⓒ Set VR701 in the middle between the points learned in the above steps "a" and "b".

(7) Turn off the power supply switch of the player.

F. PLL-Einstellung

(1) CH-1 des Oszilloskops (links oder rechts) an die Klemme 803 der Haupt-Schaltplatte und die Erdungsklemme GND des Gehäuses anschließen.

Einstellung des Oszilloskops---
- Spannung : 1,0V
- Ablenkung : 1ms
- Eingangsumschalter : Gleichstrom

(2) Die Stromversorgung des Geräts einschalten.

(3) Mit dem open/close-Schalter den Testdisk (SZZP1014F) in das Gerät einlegen.

(4) Das Gerät auf Wiedergabe stellen.

(5) TR8 oder 13 (BS 0,5 mm) des Testdisks abspielen.

(6) Die Signalform auf dem Oszilloskop beobachten und VR 701 folgendermaßen einstellen.

ⓐ VR701 langsam nach oben drehen und herausfinden, an welchem Punkt die Signalform beginnt, wie in der Abb. 1-13 "schlecht", gestört zu werden.

ⓑ VR 701 langsam nach unten drehen (entgegengesetzt zu a) (oben) und herausfinden, an welchem Punkt die Signalform auf dem Oszilloskop beginnt, gestört zu werden.

ⓒ VR 701 in eine Mittelposition zwischen den Punkten aus den Schritten a) und b) einstellen.

(7) Die Stromzufuhr zum Gerät abschalten.

F. Réglage du circuit d'asservissement de phase

(1) Raccorder le canal 1 de l'oscilloscope à la borne C803 (aux branches de droite ou de gauche) de la plaquette à circuits imprimés principale et à la borne de la mise à la terre du châssis.

Réglages de l'oscilloscope ---
- Tension : 1,0 V
- Balayage : 1 msec.
- Sélecteur d'entrée : C.C.

(2) Mettre en marche l'interrupteur d'alimentation du lecteur.
(3) Installer le disque d'essai (SZZP1014F) dans le dispositif de support pour disque en utilisant la touche d'ouverture/fermeture.
(4) Régler le lecteur sur le mode d'audition.
(5) Faire jouer la piste 8 ou 13 (zone d'interférence de 0,5 mm) du disque d'essai (SZZP1014F).
(6) Vérifier la forme d'onde affichée sur l'oscilloscope et régler VR701 selon les étapes suivantes.
   ⓐ Tourner lentement VR701 vers le haut et observer l'endroit où la forme d'onde sur l'oscilloscope commence à être perturbée, comme il est montré à la Fig. 1-13 (Incorrect).
   ⓑ Tourner lentement VR701 vers le bas (dans la direction opposée à celle du paragraphe "a" ci-dessus) et observer l'endroit où la forme d'onde sur l'oscilloscope commence à être perturbée.
   ⓒ Régler VR701 au milieu, entre les points observés aux étapes "a" et "b" ci-dessus.
(7) Mettre hors circuit l'interrupteur d'alimentation du lecteur.

F. Ajuste PLL

(1) Conectar el CANAL-1 del osciloscopio al terminal C803 (tanto el borne de la derecha como el de la izquierda) de la TCI principal y el terminal de TIERRA del chasis.

Fijación del osciloscopio --
- Voltaje : 1,0 V
- Barrido : 1mseg.
- Selector de potencia de entrada : CD

(2) Encender el interruptor de fuente de energía del tocadiscos.
(3) Poner la disqueta de prueba (SZZP1014F) en su soporte con la llave de abierto/cerrado.
(4) El todaciscos en el modo de audición.
(5) Tocar la pista ó 13 (BS 0,5mm) del disco de prueba (SZZP1014F).
(6) Verificar la forma de onda que se muestra en el osciloscopio y ajustar VR 701 (resistencia variable) en los siguientes pasos.
   ⓐ Hacer girar VR701 hacia arriba poco a poco, tomando cuenta del punto en que la forma de onda en el osciloscopio comienza a deformarse como se ve en la Fig. 1-13 NG.
   ⓑ Hacer girar VR701 hacia abajo poco a poco (en dirección contraria a lo dicho en el párrafo "a") y tomar nota del punto en que la forma de onda en el osciloscopio comienza a deformarse.
   ⓒ Fijar VR 701 en el punto medio entre los dos anotados en los pasos "a" y "b".
(7) Apagar el interruptor de la fuente de energía del tocadiscos.

G. Check of play operation after adjustment

Check of skip search:
1. Play an ordinary disc.
2. Press the skip button and check to see that skip search is given. (Forward and reverse)

Check of manual search :
1. Play an ordinary disc
2. Press the manual search button and check to see that smooth manual search can be done at low and high speeds. (Forward and reverse)

Check for defects :
1. Play the band 8 or 13 of test disc, and check to see that there is no sound skip or noise. (Black spot)
2. Play the band 10 or 14 of test disc, and check to see that there is no sound skip or noise. (Finger print)

G. Vérification du fonctionnement de l'audition après le réglale

Vérification de la recherche par sauts :
1. Faire jouer un disque normal.
2. Appuyer respectivement sur les touches de saut (vers l'avant et vers l'arrière) et vérifier si la recherche par sauts fonctionne correctement.

Vérification de la recherche manuelle:
1. Faire jouer un disque normal.
2. Appuyer sur la touche de recherche manuelle et vérifier si une recherche manuelle (vers l 'avant et vers l'arrière) aisée et sans à-coups peut être effectuée à des vitesses faibles et élevées.

Vérification pour des défauts:
1. Faire jouer la plage 8 ou 13 du disque d'essai et vérifier s'il n'y a pas de parasites ou d'omission du son. (Zone d'interférence)
2. Faire jouer la plage 10 ou 14 du disque d'essai et vérifier s'il n'y a pas de parasites ou d'omission du son. (Marque de doigts)

G. Überprüfung der Wiedergabe nach der Einstellung

Überprüfung der autom. Liedanfang-Suche:
1. Einen normalen Disk abspielen.
2. Suchknopf drücken und vergewissern, daß die Suche durchgeführt wird. (Vorwärts und rückwärts)

Überprüfung der manuellen Liedanfang-Suche:
1. Einen normalen Disk spielen.
2. Handsuchknopf drücken und vergewissern, daß die manuelle Suche bei hoher und normaler Geschwindigkeit reibungslos abläuft. (Vorwärts und rückwärts)

Fehlersuche:
1. Spur 8 oder 13 des Testdisks abspielen und überprüfen, ob etwas übersprungen wird oder Geräusche auftreten (Schwarzer Fleck).
2. Spur 10 oder 14 des Testdisks abspielen und überprüfen, ob etwas übersprungen wird oder Geräusche auftreten (Fingerabdruck).

G. Verificación de la operación de audición después del ajuste

Verificación del salto de rastreo:
1. Tocar una disqueta ordinaria.
2. Presionar el botón de salto (silencio) y verificar si ocurre el salto de rastreo. (De avance y retroceso).

Verificación del rastreo manual:
1. Tocar una disqueta ordinaria.
2. Presionar el botón de rastreo manual y comprobar si se realiza suavemente el rastreo manual a velocidades bajas y altas (De aavance y retroceso).

Verificación por si hay defectos:
1. Usar la banda 8 ó 13 de la disqueta de prueba y comprobar si hay saltos de sonido o ruídos. (Puntos negros).
2. Usar la banda 10 ó 14 de la disqueta de prueba y comprobar si hay saltos de sonido o ruídos. (Marcas digitales).

3. HOW TO HANDLING OPTICAL PICK-UP
3. HANDHABUNG DES OPTISCHEN ABNEHMERS
3. COMMENT MANIPULER LA TETE DE LECTURE OPTIQUE
3. COMO MANEJAR EL CAPTADOR OPTICO

ENGLISH

The laser diode in the optical pick-up may be damaged by potential difference caused by static charge on clothing or body. Pay careful attention to damage by static charge when repaired.

DEUTSCH

Die Laserdiode im optischen Abnehmer kann durch Spannungsunterschiede, die durch statische Aufladung der Kleidung oder des Körpers entstehen können, beschädigt werden. Bei Reparaturen ist es geraten, mögliche Schäden durch statische Aufladung zu verhindern.

FRANÇAIS

La diode laser installée dans la tête de lecture optique risque d'être endommagée par la différence de potentiel provoquée par la charge statique sur les vêtemenst ou le corps. Lorsqu'on répare, prendre garde à une éventuelle détérioration causée par la charge statique.

ESPAÑOL

El diodo de láser en el captador óptico puede ser dañado por una diferencia de potencial causada por una carga estática o parásita de la ropa o el cuerpo. Tener mucho cuidado de no dañarlo con corriente parásita al repararlo.

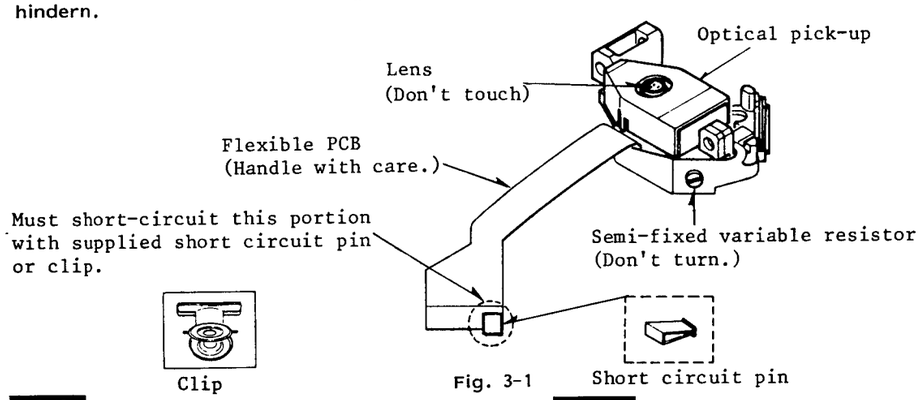


Fig. 3-1

ENGLISH

■ Handling of Optical Pick-up

1. Don't give a heavy shock to the optical pick-up which is very precisely constructed.
2. A charge prevention pin is inserted in the flexible PCB for preventing damage to the laser diode. The pin should be removed or installed in a short time.
3. Handle the flexible PCB with care because PCB may be cut if an excessive stress is applied.
4. Don't meddle with the laser power adjusting VR which is adjusted prior to shipping.

DEUTSCH

■ Handhabung des optischen Abnehmers

1. Der optische Abnehmer ist ein Präzisionsinstrument, das keinen schweren Erschütterungen ausgesetzt werden sollte.
2. Eine Klammer zur Vermeidung von statischer Aufladung ist im Inneren der biegsamen Schaltplatte angebracht. Diese Klammer sollte so schnell wie möglich aus- oder eingebaut werden.
3. Die biegsame Schaltplatte sollte behutsam behandelt werden, da sie keine größeren Belastungen verträgt.
4. Der Regelwiderstand für die Leistung des Lasers ist vor dem Versand eingestellt worden und sollte belassen werden, wie er ist.

FRANÇAIS

■ Manipulation de la tête de lecture optique

1. Ne pas donner de fortes secousses à la tête de lecture optique dont le montage est d'une grande précision.
2. Une broche neutralisatrice de charge est insérée dans la plaquette à circuits imprimés flexible pour éviter la détérioration de la diode laser. La broche devra être retirée ou installée rapidement.
3. Manipuler la plaquette à circuits imprimés flexible avec précaution car elle risque d'être sectionnée si une tension excessive y est appliquée.
4. En réglant la résistance variable, ne pas s'occuper de l'énergie du laser qui a déjà été réglé avant l'expédition.

ESPAÑOL

■ Manejo del captador óptico

1. Evitar los golpes en el captador óptico, que es un instrumento de gran precisión.
2. Para evitar daños en el diodo de láser, hay una grapa protectora en la TCI flexible. La grapa se debe poner o quitar en el tiempo más corto posible.
3. Manejar con cuidado la TCI flexible, porque podría cortarse al aplicarle tensión excesiva.
4. No tocar la RV de ajuste de láser, que ya está ajustado antes del envío.

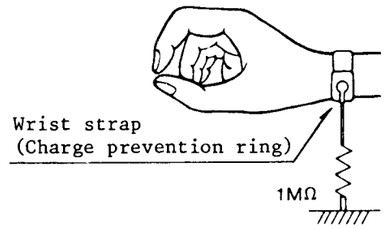


Fig. 3-2

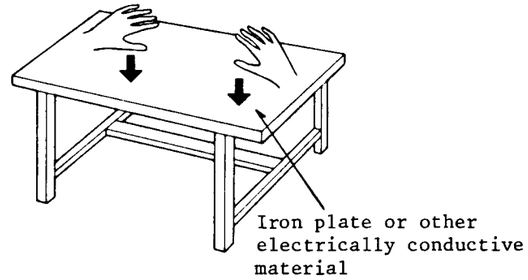


Fig. 3-3

ENGLISH

■ Grounding for Preventing Static Charge Damage

1. Body Grounding: Put the charge preventing wrist strap for discharging electricity from the body.
2. Working Table Grounding: Lay electrically conductive material (conductive sheet) or an iron plate on the table where the optical pick-up is placed, and ground the material or sheet to the floor.

Note: Static charge of clothing is not discharged from the wrist strap. Exercise care so that clothing shall not touch the wrist strap.

FRANÇAIS

■ Mise à la terre pour éviter une détérioration de la charge statique

1. Misa à la terre du corps:
   Installer une attache neutralisatrice de charge au poignet pour le déchargement de l'électricité provenant du corps.
2. Mise à la terre de la table de travail:
   Installer un matériau électriquement conductif (plaque conductible) ou une plaque de fer sur la table où la tête de lecture optique est placée et relier à la terre le matériau ou la plaque.

Nota: La charge statique des vêtements n'est pas déchargée à partir de l'attache fixée au poignet. On devra donc prendre garde que les vêtements ne touchent pas l'attache du poignet.

DEUTSCH

■ Erdung zur Verhütung von Schäden durch statische Aufladung

1. Körpererdung :
   Legen Sie das Armband um, das Elektrizität aus dem Korper entlädt.
2. Arbeitstischerdung :
   Legen Sie elektrisch leitfähiges Material (Folie) oder eine Metallplatte auf dem Tisch aus, auf den der optische Abnehmer gelegt wird, und erden Sie das Material oder die Folie.

Hinweis: Ladungselektrizität der Kleidung wird vom Armband nicht entladen. Seien Sie vorsichtig, daß Ihre Kleidung das Arband nicht berührt.

ESPAÑOL

■ Contacto con tierra para evitar los daños de la corriente parásita.

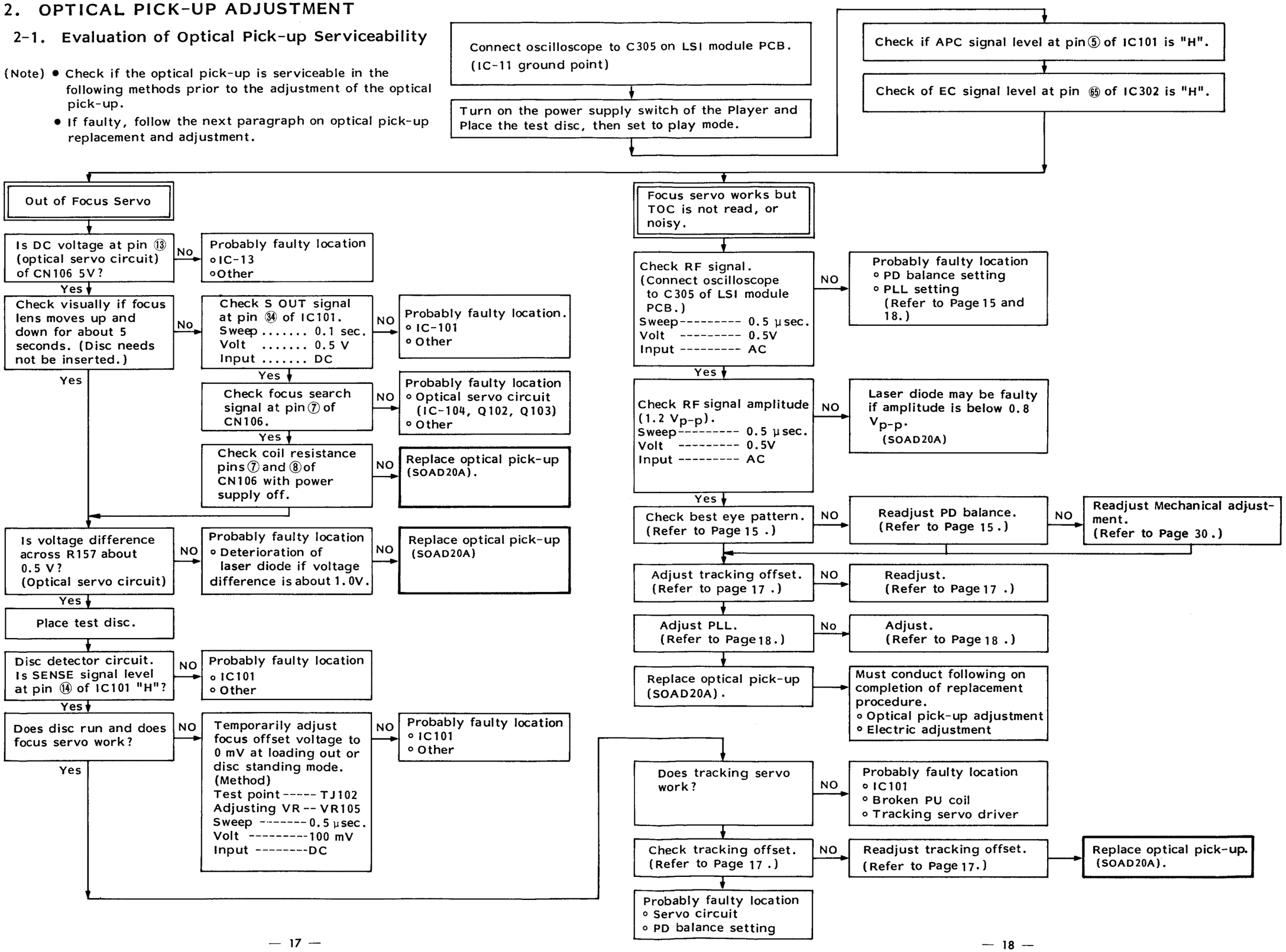
1. Contacto del cuerpo con tierra:
   Para la descarga de la electricidad estática del cuerpo, ponerse la banda pulsera.
2. Contacto del banco de trabajo con tierra:
   Poner sobre el banco de trabajo un material conductor (tapete conductor) o una placa metálica donde se ha de colocar el captador óptico, conectando con tierra el material conductor.

Nota: La electricidad parásita de los vestidos no se suelta con la banda pulsera. Tener cuidado para que la banda pulsera no toque los vestidos.

2. OPTICAL PICK-UP ADJUSTMENT

2-1. Evaluation of Optical Pick-up Serviceability

(Note) • Check if the optical pick-up is serviceable in the following methods prior to the adjustment of the optical pick-up.
• If faulty, follow the next paragraph on optical pick-up replacement and adjustment.


Connect oscilloscope to C305 on LSI module PCB. (IC-11 ground point)
Turn on the power supply switch of the Player and Place the test disc, then set to play mode.
Check if APC signal level at pin ⑤ of IC101 is "H".
Check of EC signal level at pin ⑮ of IC302 is "H".
Out of Focus Servo
Is DC voltage at pin ⑬ (optical servo circuit) of CN106 5V?
No
Probably faulty location ∘IC-13 ∘Other
Yes
Check visually if focus lens moves up and down for about 5 seconds. (Disc needs not be inserted.)
No
Check S OUT signal at pin ㉞ of IC101. Sweep ..... 0.1 sec. Volt ..... 0.5 V Input ..... DC
NO
Probably faulty location. ∘IC-101 ∘Other
Yes
Check focus search signal at pin ⑦ of CN106.
NO
Probably faulty location ∘Optical servo circuit (IC-104, Q102, Q103) ∘Other
Yes
Check coil resistance pins ⑦ and ⑧ of CN106 with power supply off.
NO
Replace optical pick-up (SOAD20A).
Yes
Is voltage difference across R157 about 0.5 V? (Optical servo circuit)
NO
Probably faulty location ∘Deterioration of laser diode if voltage difference is about 1.0V.
NO
Replace optical pick-up (SOAD20A)
Yes
Place test disc.
Disc detector circuit. Is SENSE signal level at pin ⑭ of IC101 "H"?
NO
Probably faulty location ∘IC101 ∘Other
Yes
Does disc run and does focus servo work?
NO
Temporarily adjust focus offset voltage to 0 mV at loading out or disc standing mode. (Method) Test point ----- TJ102 Adjusting VR -- VR105 Sweep -------0.5 µsec. Volt ---------100 mV Input --------DC
NO
Probably faulty location ∘IC101 ∘Other
Yes
Focus servo works but TOC is not read, or noisy.
Check RF signal. (Connect oscilloscope to C305 of LSI module PCB.) Sweep--------- 0.5 µsec. Volt --------- 0.5V Input --------- AC
NO
Probably faulty location ∘PD balance setting ∘PLL setting (Refer to Page 15 and 18.)
Yes
Check RF signal amplitude (1.2 Vp-p). Sweep--------- 0.5 µsec. Volt --------- 0.5V Input --------- AC
NO
Laser diode may be faulty if amplitude is below 0.8 Vp-p. (SOAD20A)
Yes
Check best eye pattern. (Refer to Page 15 .)
NO
Readjust PD balance. (Refer to Page 15 .)
NO
Readjust Mechanical adjustment. (Refer to Page 30 .)
Adjust tracking offset. (Refer to page 17 .)
NO
Readjust. (Refer to Page 17 .)
Adjust PLL. (Refer to Page 18.)
No
Adjust. (Refer to Page 18 .)
Replace optical pick-up (SOAD20A).
Must conduct following on completion of replacement procedure. ∘Optical pick-up adjustment ∘Electric adjustment
Does tracking servo work?
NO
Probably faulty location ∘IC101 ∘Broken PU coil ∘Tracking servo driver
Check tracking offset. (Refer to Page 17 .)
NO
Readjust tracking offset. (Refer to Page 17.)
Replace optical pick-up. (SOAD20A).
Probably faulty location ∘Servo circuit ∘PD balance setting

4. OPTICAL PICK-UP REPLACEMENT PROCEDURE

Note • Exercise care so that disassembled parts shall not be lost.

• Set up the player so that it can be power on checked as shown in Fig. 4-1 according to the disassembly procedure outlined in the service manual.

4-1. Power on check status

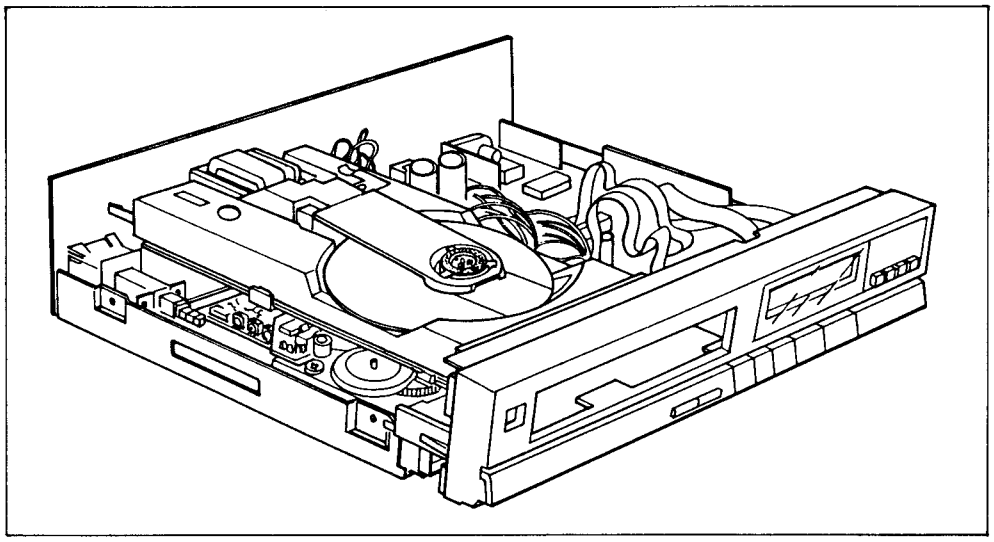


Fig. 4-1

4-2. Removal of Traverse Unit (Optical Deck Unit)

ⓐ Remove one screw fastening the traverse unit.
ⓑ Remove the traverse unit by lifting it in the direction shown by the arrow.
Exercise care because the leads connectors (CN501, BT101, BT102, BT103) from the servo circuit are connected to the main PCB at the time.

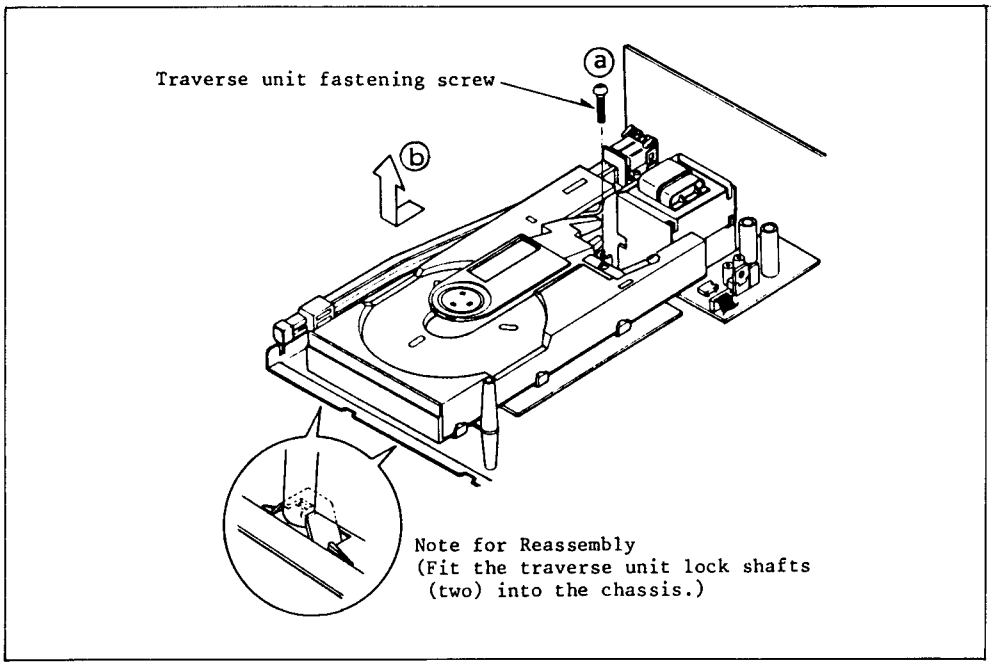


Fig. 4-2

4-3. Separation of Traverse Unit and Optical Pick-up

ⓐ Place soft cloth etc. between the traverse unit and the chassis for preventing short circuit and scratches etc.
(Stick a tape to the ornament plate of the disc holder for sure.)

ⓑ Put upside down and set the traverse unit in the chassis as shown in Fig. 4-3.
The leads connector need not be disconnected.

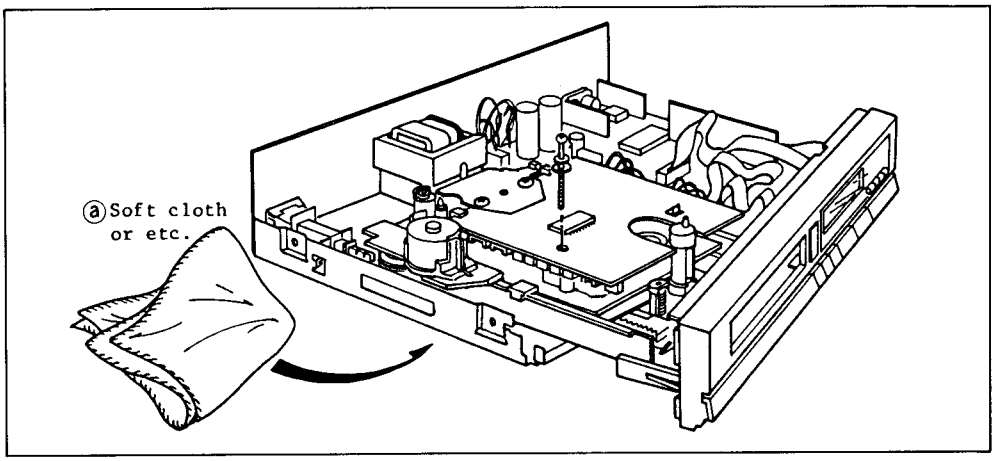


Fig. 4-3

ⓒ Disconnect four connectors CN101, CN102, CN103 and CN104.
(Exercise extreme care in reassembly so that the connectors shall not be inserted in wrong position.)

②pin Connector from the loading motor	→ CN103	Servo circuit
②pin Connector from the open detection switch	→ CN102	
②pin Connector from the close detection switch	→ CN101	
③pin Connector from position detection resistors	→ CN104	

ⓓ Remove one screw fastening the servo circuit.

ⓔ Unfasten the locking clamp of the servo circuit.

(Note) • Pay carefull attention to the flexible PCB led from the optical pick-up when the PCB of the optical servo circuit is removed.

• Must short-circuit the flexible PCB as specified in Fig. 3-1, when the flexible PCB is disconnected from CN106.

ⓕ Slowly lift up the servo PCB to an adequate position with extreme care to the flexible PCB.

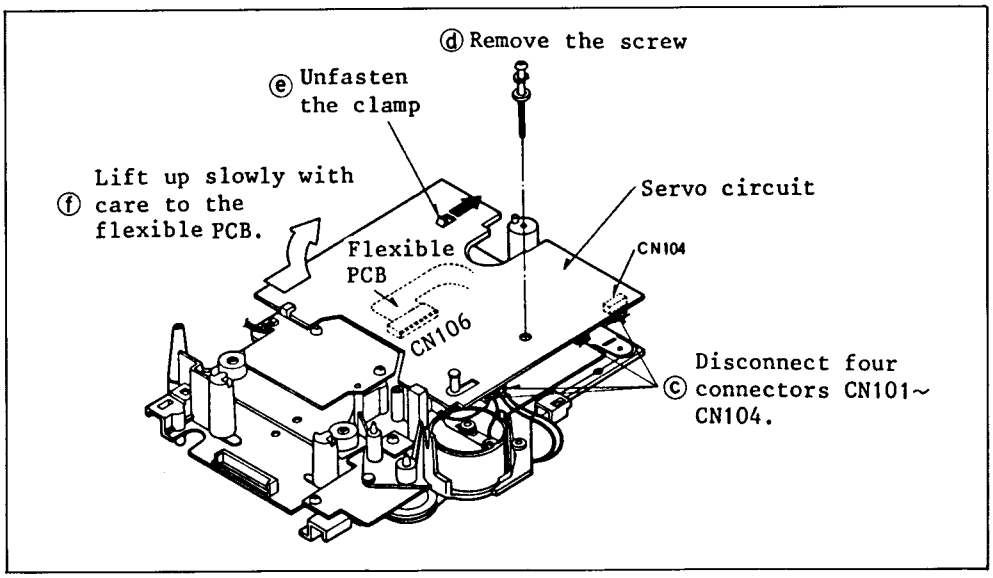


Fig. 4-4

4-4. Removal of Flexible PCB and Servo Circuit CN106 from Optical Pick-up

ⓐ Lift the servo circuit PCB to an adequate position.

ⓑ CN106 is a locking connector. Disconnect the right and left of the lock housing alternately.

ⓒ Hold and remove the reinforce (Fig. 4-5) from the flexible PCB.

Must remove the flexible PCB by holding the reinforce of the FPC cord. If other place is held, the flexible PCB may be damaged.

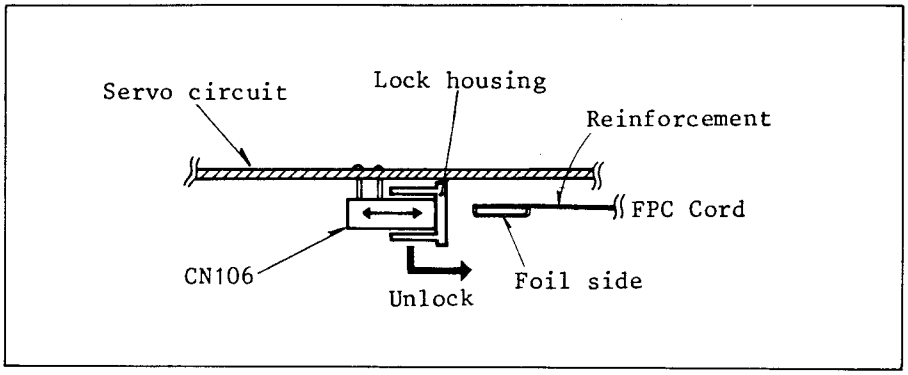


Fig. 4-5

- Set the foil side of the flexible PCB as shown in Fig. 4-5 when reassembled. If connected with the foil side on the wrong side, the player may be damaged.

(Note) • When the flexible PCB is disconnected from CN106, Voluntary position should be short-circuited as shown in Fig. 3-1.

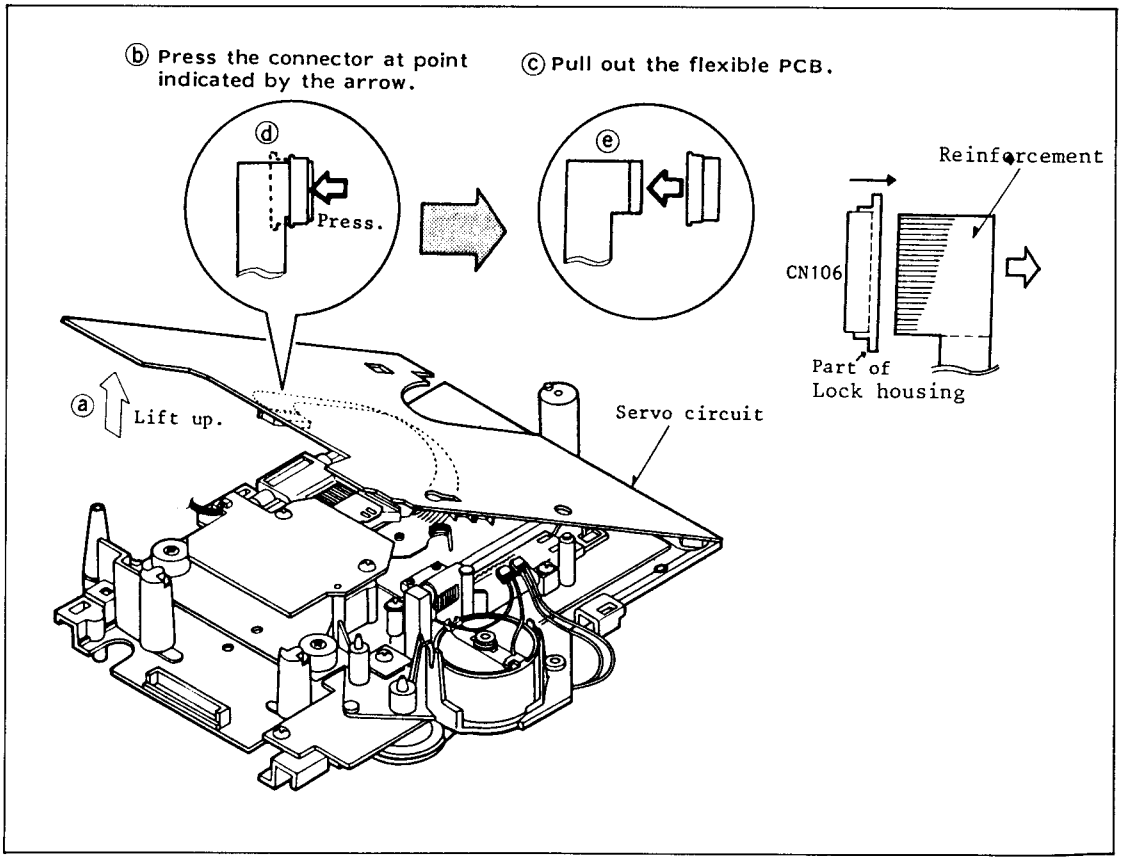


Fig. 4-6

4-5. Removal of Optical Pick-up

ⓐ Remove the six screws fastening the optical pick-up.

ⓑ Set free position the transportation lock lever of the optical pick-up.

ⓒ Separate the optical pick-up and linear traverse drive from the traverse unit.

ⓓ Remove two cushion rubbers.

ⓔ Remove the two guide shafts of the optical pick-up. (In reassembly, clean the guide shafts because they are sliding contact parts of the optical pick-up. The guide shafts need not be coated with grease.)

ⓕ Detach two linear drive coils by a soldering iron. (Pay extreme attention to the orientation of the coils in reassembly, then have directivity.)

ⓖ Remove the four screws fastening the linear drive coil to the optical pick-up.

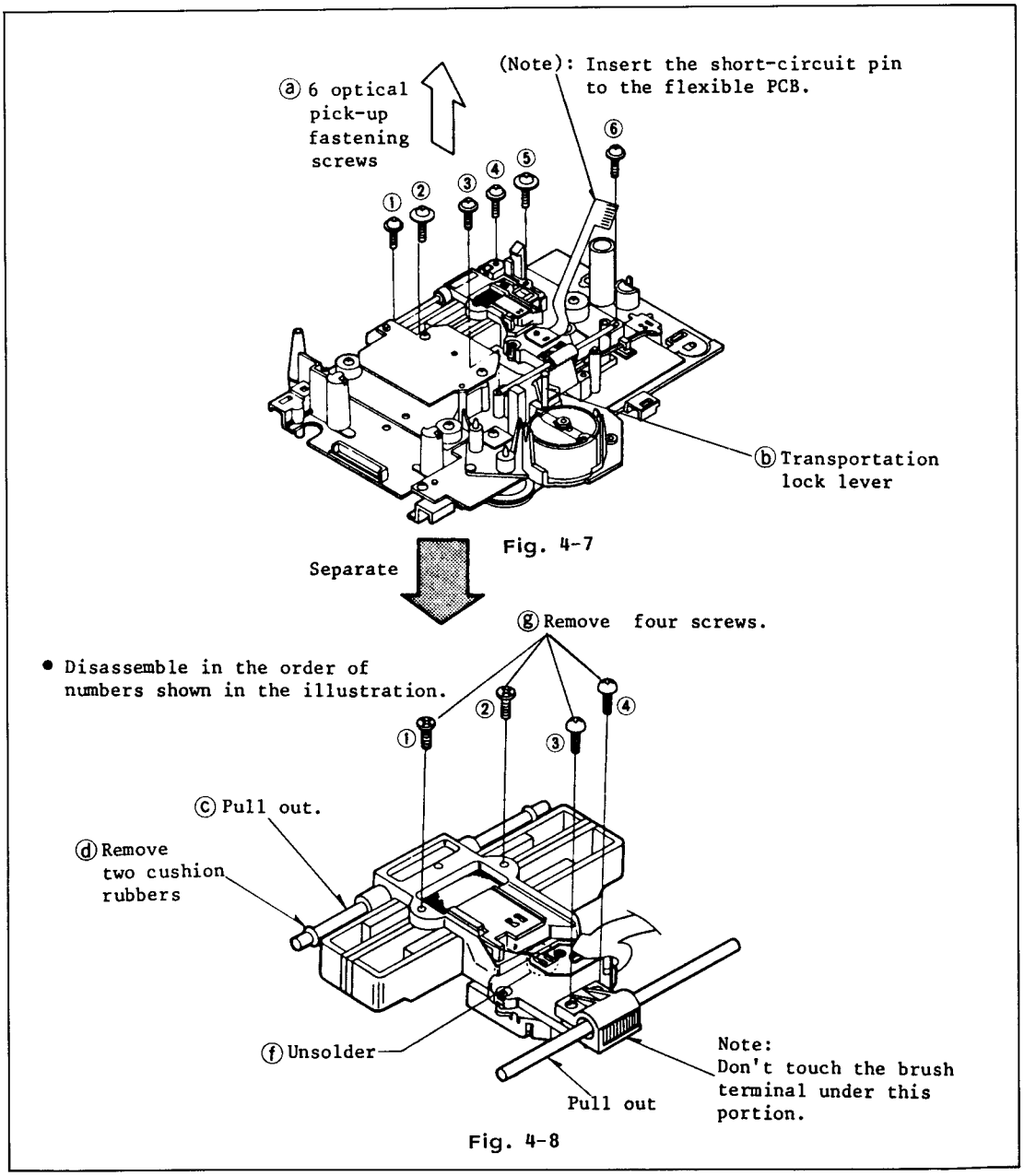

(Note): Insert the short-circuit pin to the flexible PCB.
ⓐ 6 optical pick-up fastening screws
ⓑ Transportation lock lever
Separate
ⓖ Remove four screws.
• Disassemble in the order of numbers shown in the illustration.
ⓒ Pull out.
ⓓ Remove two cushion rubbers
ⓕ Unsolder
Pull out
Note: Don't touch the brush terminal under this portion.

Fig. 4-7

Fig. 4-8

4-6. Removal of Drive Coil

ⓐ Remove two yokes. (The yokes have no directivity.)

ⓑ Remove the drive coil.

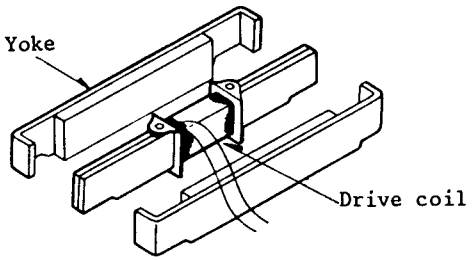


Fig. 4-9

DC resistance of drive coil
about 36Ω ±1.5Ω

• Installation of drive coil
Solder the marking side of the coil to ⓐ and the no-marking side to ⓑ.

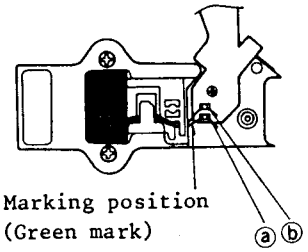


Fig. 4-10

4-7. Installation of Optical Pick-up

Install the optical pick-up in the reversed order of the disassembling steps so that power on check can be conducted as shown in Fig. 4-11 However, don't install one screw fastening the servo circuit PCB. Strictly observe the notes shown in the disassembling procedure.

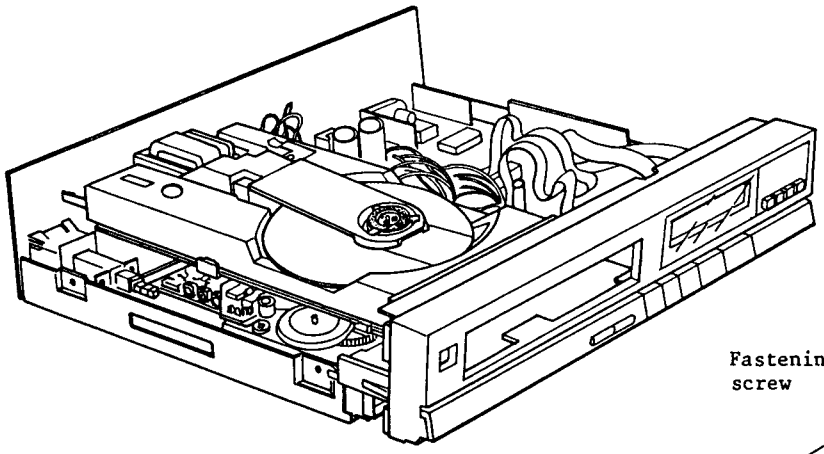


Fig. 4-11.

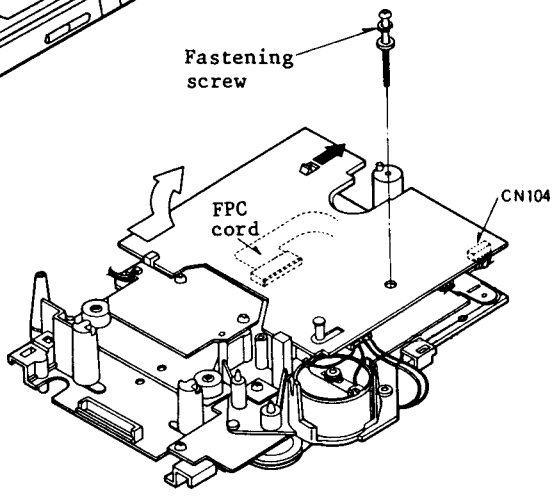


Fig. 4-12

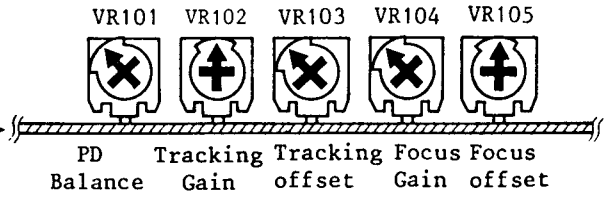
5. ADJUSTING PROCEDURE OF OPTICAL PICK-UP
5. EINSTELLUNG DES OPTISCHEN ABNEHMERS
5. PROCEDURE DE REGLAGE DE LA TETE DE LECTURE OPTIQUE
5. PROCEDIMIENTO DE AJUSTE DEL CAPTADOR OPTICO

5-1. Adjusting steps and Points of optical pick-up
5-1. Schritte und Vorgänge bei der Einstellung des optischen Abnehmers
5-1. Points et étapes du réglage de la tête de lecture optique
5-1. Pasos del ajuste y puntos del captador óptico

- Set up player according to disassembling procedure so that power-on check can be conducted.
- Das Gerät gemäß der Ausbauanleitung so vorbereiten, daß es während des Betriebs untersucht werden kann.
- Installer l'appareil selon la procédure de démontage, de telle sorte qu'une vérification de mise sous tension puisse être effectuée.
- Fijar el tocadiscos para el proceso de desarmado de forma que se pueda hacer la verificación del contacto con la fuente de energía

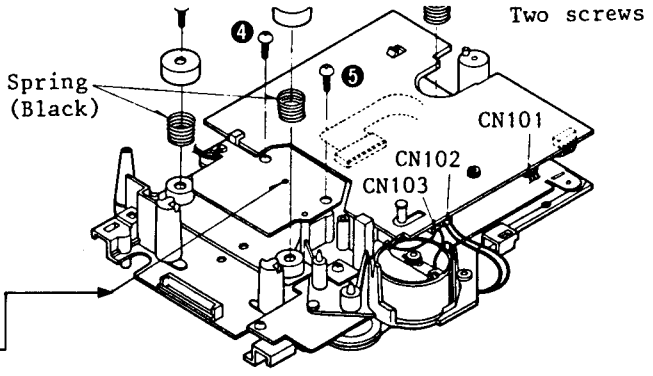
↓

- Temporarily set adjusting variable resistors on servo PCBs.
- Regelwiderstände provisorisch an die Servo-Schaltplatte legen.
- Régler temporairement les résistances variables de mise au point sur les plaquettes à circuits imprimés d'asservissement.
- Ajustar temporalmente las resistencias variables de la TCI de servo.



↓

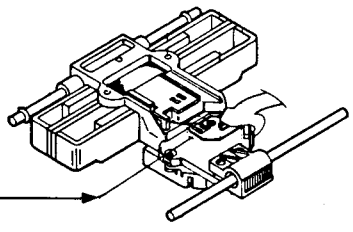
- Adjust turntable height.
- Drehtellerhöhe einstellen.
- Hauteur de réglage de la platine
- Ajustar la altura del plato giratorio.



Note: Don't tamper with this screw.

↓

- Mechanical adjustment
- Mechanische Einstellung
- Réglage mécanique
- Ajuste mecánico.



↓

- Electric adjustment
- Elektrische Einstellung
- Réglage électrique
- Ajuste eléctrico.

5-2. Required Measuring Instruments and Tools

1. Two-channel oscilloscope (with external trigger), over 30 MHz.
2. Test disc (SZZP1014F)
3. Hexagonal wrench--------1.5 mm (SZZP1044C)
4. General tools

5-2. Appareils et outils de mesurage reguis

1. Oscilloscope à double canal (avec déclenchement extérieur); plus de 30 MHz.
2. Disque d'essai (SZZP1014F)
3. Clé hexagonale ----------1,5mm (SZZP1044C)
4. Outils généraux

5-2. Erforderliche Instrumente und Werkzeuge

1. 2-Kanal Oszilloskop (mit externem Auslöser) über 30 MHz.
2. Testdisk (SZZP1014F)
3. Inbus-Schlüssel ---------1,5mm (SZZP1044C)
4. Allgemein übliche Werkzeuge

5-2. Pasos y puntos de ajuste del captador óptico

1. Osciloscopio de dos canales (con disparo exterior), de más de 30 MHz.
2. Disqueta de prueba (SZZP1014F)
3. Llave allen ----------1,5mm (SZZP1044C)
4. Herramientas generales

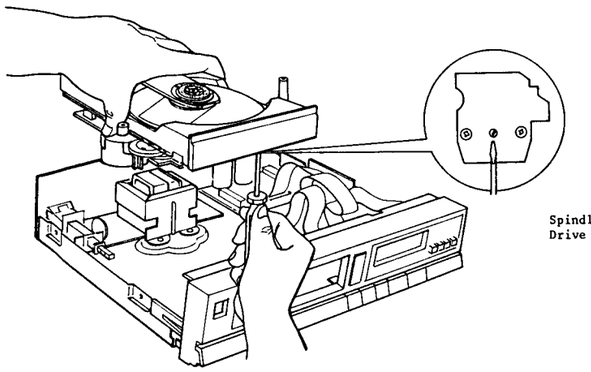


Fig. 5-1

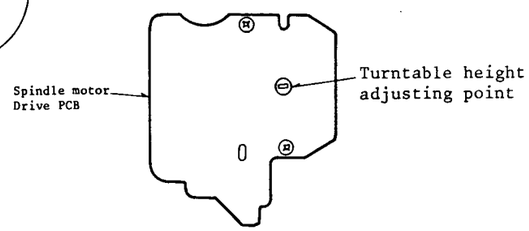


Fig. 5-2

ENGLISH

NOTE:
Adjust turntable height by paying attention to the adjusting screw because the screw is plastic. Replace the screw (Part No.: SNSD3) if the screw is moved.

FRANÇAIS

NOTA:
Régler la hauteur de la platine en prenant garde à la vis de réglage car elle est en plastique. Remplacer la vis si elle est abîmée (N° de pièce: SNSD3).

DEUTSCH

HINWEIS:
Beim Einstellen der Drehtellerhöhe vorsichtig vorgehen, da die Schraube aus Plastik ist. Bei Beschädigung die Schraube (Teil-Nr.: SNSD3) auswechseln.

ESPAÑOL

NOTA:
Ajustar la altura del plato giratorio teniendo cuidado con el tornillo de ajuste que está hecho de plástico. (No. de pieza SNSD3). Cambiarlo si está dañado.

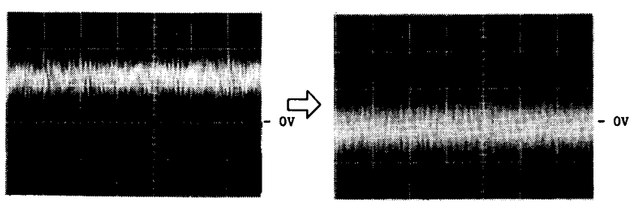


Fig. 5-3

A. Turn Table Height Adjustment

(1) Turn on the power supply switch of the player.
(2) Place the test disc (SZZP1014F) to the disc holder.
(3) Turn off the power supply switch of the player.
(4) Set the oscilloscope to DC zero balance.
(5) Connect the CH-1 of the oscilloscope to TJ102 of the servo circuit and GND to the chassis.

Oscilloscope settings
- Sweep : 5m sec.
- Volt : 100mV
- Input selector: DC

(6) Turn on the power supply switch of the player.
(7) Play back a desired track.
(8) Hold the traverse unit (optical deck unit) by the hands as shown in Fig. 5-1 with care not to give vibration to the traverse unit.
(9) Turn the adjusting screw on the underside of the spindle motor PCB by a flat screwdriver so that the waveform at TJ102 shall be 0 ± 50 mV as shown in Fig. 5-3.
(10) Turn off the power supply switch of the player.
(11) Lock the adjusting screw with "Neji Lock (like a nail paint)" or a bond on completion of adjustment.

A. Réglage de la hauteur de la platine

(1) Mettre en marche l'interrupteur d'alimentation de l'appareil.
(2) Installer le disque d'essai (SZZP1014F) dans le dispositif de support pour disque.
(3) Mettre hors tension l'interrupteur d'alimentation de l'appareil.
(4) Régler l'oscilloscope avec un équilibrage sur zéro C.C.
(5) Raccorder le canal 1 de l'oscilloscope à TJ102 du circuit d'asservissement et GND (mise à la terre) au châssis.

Réglages de l'oscilloscope
- Balayage : 5 msec.
- Tension : 100 mV
- Sélecteur d'entrée: C.C.

(6) Mettre en marche l'interrupteur d'alimentation de l'appareil.
(7) Faire jouer la piste désirée.
(8) Tenir l'unité transversale (élément de la platine optique) avec les mains comme il est montré à la Fig. 5-1, en prenant garde de ne pas la faire osciller.
(9) Tourner la vis de réglage située sur la face inférieure de la plaquette à circuits imprimés du moteur à axe avec un tournevis à tête plate, de telle sorte que la forme d'onde à TJ102 soit de 0 ± 50 mV, comme il est montré à la Fig. 5-3.
(10) Mettre hors tension l'interrupteur d'alimentation de l'appareil.
(11) Bloquer la vis de réglage avec le produit "Neji Lock" (sorte de vernis à ongles) ou une substance adhésive analogue, une fois achevé le réglage.

A. Einstellung der Drehtellerhöhe

(1) Stromversorgung des Geräts einschalten.
(2) Testdisk (SZZP1014F) in den Halter einlegen.
(3) Stromversorgung des Geräts abschalten.
(4) Das Oszilloskop wie unten beschrieben einstellen.
(5) CH-1 des Oszilloskops an TJ 102 des Servo-Schaltkreises und GND (Erdung) des Gehäuses anschließen.

Einstellung des Oszilloskops
- Ablenkung : 5ms
- Spannung : 100mV
- Eingangsumschalter : Gleichstrom

(6) Stromzufuhr zum Gerät einschalten.
(7) Gewünschte Spur abspielen.
(8) Den Seitenrichttrieb (optisches System) wie in Abb. 5-1 in der Hand halten, ohne es zu erschüttern.
(9) Die Einstellschraube an der Unterseite des Wellenmotor-Kontakts mit einem flachen Schraubenzieher so drehen, daß die Signalform wie in Abb. 5-3 bei TJ 102 0 ± 50mV beträgt.
(10) Die Stromzufuhr zum Gerät abschalten.
(11) Die Einstellschraube mit "Neji Lock" (ähnlich wie Nagellack) oder Kleber nach erfolgter Einstellung arretieren.

A. Ajuste de la altura del plato giratorio

(1) Encender el interruptor de fuente de energía del tocadiscos.
(2) Poner la disqueta de prueba (SZZP1014F) en su soporte.
(3) Encender el interruptor de fuente de energía del tocadiscos.
(4) Fijar el osciloscopio en el balance cero de CD.
(5) Conectar el CANAL-1 del osciloscopio a TJ102 del circuíto de servo y TIERRA al chassis.

Fijaciones del osciloscopio
- Barrido : 5m
- Voltaje : 100mV
- Selector de potencia de entrada: CD

(6) Encender el interruptor de la fuente de energía del tocadiscos.
(7) Tocar algo en la pista que se desee.
(8) Mantener la unidad transversal (unidad del conjunto óptico) con la mano como se muestra en la Fig. 5-1 cuidando de no agitarla.
(9) Hacer girar el tornillo de fijación en la parte baja de la TCI del motor de vástago con un destornillador plano hasta que la forma de onda en TJ102 sea ± 50mV como se muestra en la Fig. 5-3.
(10) Encender el interruptor de la fuente de energía del tocadiscos.
(11) Asegurar el tornillo de ajuste con "Neji Lock" (semejante a la laca de uñas) o pintura fijadora una vez completado el ajuste.

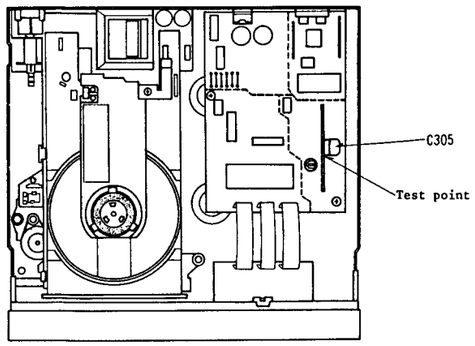


Fig. 5-4

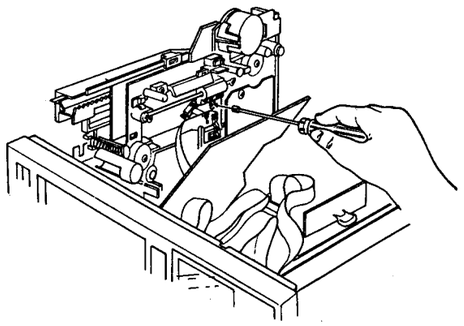


Fig. 5-5

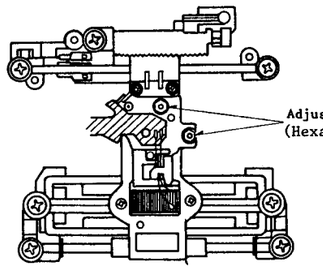


Fig. 5-6

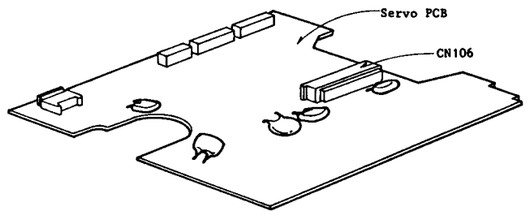


Fig. 5-7

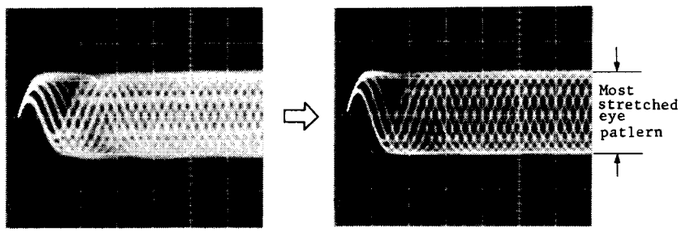


Fig. 5-8

B. Mechanical Adjustment

(1) Turn on the power supply switch of the player.

(2) Insert the test disc (SZZP1014F) in the disc holder.

(3) Turn off the power supply switch of the player.

(4) Set the oscilloscope as stated below.

Oscilloscope settings
- Sweep : 0.5 µsec.
- Volt : 0.5V
- Input selector : AC

(5) Connect CH-1 of the oscilloscope to C305 on the LSI module and GND to the IC-11Ⓖ.

(6) Turn on the power supply switch of the player.

(7) Play back TR6

(8) Set the player in the playback mode as shown in Fig. 5-4. with care not to give vibration to the traverse unit.

(9) Remove the servo circuit PCB as shown in Fig. 5-5 and check whether or not the two mechanical adjusting screws located on the underside of the pick-up are it should be outside the spindle PCB.
If they are located in a range not adjustable, move the optical pick-up outwards in the skip search mode.

(10) Disconnect the servo circuit connectors (CN101, CN102, and CN103).

(11) Check if the RF signal waveform is as shown in Fig. 5-8. If the waveform can not be checked or is unlike the given waveform, proceed to the following steps.
(SZZP1044C..... 1.5mm)

(12) Set the hexagonal wrench into the socket in the heads of the mechanical adjusting screws shown in Fig. 5-5 and turn the screws right or left to optimum positions.
Pay attention to the flexible cord led from the optical pick-up.

(13) Turn off the power supply switch of the player.

(14) After adjustment, dress components C111, C128, C137, C139 and C146 to lay flat on servo circuit PCB and reassemble on the traverse unit, as shown in Fig. 5-7.

(15) Connect the connectors of the each detection switches to the servo circuit correctly. (If connected wrong, the power supply circuit and the servo circuit may become faulty.)

On completion of adjusting the optical pick-up, set the player so that it can be power-on checked as shown in Fig. 5-4 and must conduct electric adjustment.

B. Mechanische Einstellung

(1) Stromversorgung des Geräts einschalten.
(2) Testdisk (SZZP1014F) in den Halter einlegen.
(3) Stromversorgung des Geräts abschalten.
(4) Das Oszilloskop wie unten beschrieben einstellen.

Einstellung des Oszilloskops
- Ablenkung : 0,5µs
- Spannung : 0,5V
- Eingangsumschalter : Wechselstrom

(5) CH-1 des Oszilloskops an C 305 des LSI-Moduls und GND an IC-11Ⓖ anschließen.
(6) Stromversorgung des Geräts einschalten.
(7) TR6 abspielen.
(8) Das Gerät wie in Abb. 5-4 auf Wiedergabe stellen und darauf achten, daß der Seitenrichttrieb nicht erschüttert wird.
(9) Die Schaltplatte des Servo-Schaltkreises wie in Abb. 5-5 entfernen und nachsehen, ob die zwei Justierschrauben an der Unterseite des Abnehmers ordnungsgemäß außerhalb des Wellenkontakts sind.
Falls sie nicht erreichbar sind, muß der optische Abnehmer in der Betriebsart "Automat. Liedanfang-Suche" (skip-search) nach außen bewegt werden.
(10) Die Anschlüsse des Servo-Schaltkreises entfernen (CN 101, CN 102 und CN 103).
(11) Überprüfen, ob die Signalform RF wie in Abb. 5-8 aussieht. Falls sie nicht überprüft werden kann oder von der gegebenen Signalform abweicht, wie im folgenden vorgehen.
(SZZP1044C.....1,5mm)
(12) Wie in Abb. 5-5 den Inbus-Schlüssel auf die Schrauben in der Halterung aufsetzen und die Justierschrauben je nach rechts oder links drehen, bis sie optimal eingestellt sind. Vorsicht beim Umgang mit dem biegsamen Kabel vom optischen Abnehmer.
(13) Stromversorgung des Geräts abschalten.
(14) Nach beendeter Einstellung die Teile C 111, C 128, C 137, C 139 und C 146 flach auf dem Servo-Schaltkreis ausrichten und auf dem Seitenrichttrieb anbringen (s. Abb. 5-7).
(15) Die Stecker der Detektorschalter korrekt an den Servo-Schaltkreis anschließen. (Bei falschem Anschluß können der Netzschaltkreis und der Servo-Schaltkreis Schaden nehmen.)
Nach beendigter Einstellung des optischen Abnehmers das Gerät so vorbereiten, daß es in Betrieb überprüft werden kann (s. Abb. 5-4), und dann elektrische Einstellung vornehmen.

B. Réglage mécanique

(1) Mettre en marche l'interrupteur d'alimentation de l'appareil.
(2) Intaller le disque d'essai (SZZP1014F) dans le dispositif de support pour disque.
(3) Mettre hors tension l'interrupteur d'alimentation de l'appareil.
(4) Régler l'oscilloscope comme il est indiqué ci-dessous.

Réglages de l'oscilloscope	Balayage	:	0,5 µsec.
	Tension	:	0,5 V
	Sélecteur d'entrée	:	C.A.

(5) Raccorder le canal 1 de l'oscilloscope à C305 sur le module de l'intégration à grande échelle et GND (mise à la terre) à IC-11Ⓖ.
(6) Mettre en marche l'interrupteur d'alimentation de l'appareil.
(7) Faire jouer la piste 6.
(8) Régler le lecteur sur le mode de lecture, comme il est montré à la Fig. 5-4, en prenant garde de ne pas faire osciller l'unité transversale.
(9) Retirer la plaquette à circuits imprimés du circuit d'asservissement, comme il est montré à la Fig. 5-5, et vérifier si les deux vis du réglage mécanique situées sur la face inférieure de la tête de lecture sont ou non à l'extérieur de la plaquette à circuits imprimés de l'axe. Si elles sont situées dans une zone non réglable, déplacer la tête de lecture optique vers l'extérieur sur le mode de recherche par sauts.
(10) Débrancher les connecteurs (CN101, CN102 et CN103) du circuit d'asservissement.
(11) Vérifier si la forme d'onde du signal de haute fréquence est telle qu'elle est montrée à la Fig. 5-8. Si la forme d'onde ne peut être vérifiée ou si elle est différente de la forme d'onde présentée, procéder selon les étapes suivantes.
(SZZP1044C ..... 1,5 mm)
(12) Installer la clé hexagonale dans l'alvéole des têtes des vis de réglage mécanique, comme il est montré à la Fig. 5-5, et tourner la vis à droite ou à gauche aux positions optima. Prendre garde à la diode électro-luminescente du câble de raccordement de la tête de lecture optique.
(13) Mettre hors tension l'interrupteur d'alimentation de l'appareil.
(14) Après la mise au point, aligner les éléments C111, C128, C137, C139 et C146 sur la surface de la plaquette à circuits imprimés du circuit d'asservissement et remonter sur l'unité transversale, comme il est montré à la Fig. 5-7.
(15) Raccorder correctement les connecteurs de chaque commutateur de détection au circuit d'asservissement. (Si le raccordement est mal fait, le circuit de l'alimentation en courant et le circuit d'asservissement risque de devenir défectueux.)

Une fois achevé l'ajustement de la tête de lecture optique, régler l'appareil de telle sorte qu'il puisse être vérifié en le mettant sous tension comme il est montré à la Fig. 5-4 et effectuer un réglage électrique.

B. Ajuste mecánico

(1) Encender el interruptor de la fuente de energía del tocadiscos.
(2) Poner la disqueta de prueba (SZZP1014F) en su soporte.
(3) Apagar el interruptor de la fuente de energía del tocadiscos.
(4) Fijar el oscilozcopio de la manera que se indica a continuación.

Fijaciones del osciloscopio	Barrido	:	0,5 useg.
	Voltaje	:	0,5V
	Selector de potencia de entrada	:	CA

(5) Conectar el CANAL-1 del osciloscopio a C305 del módulo LSI, y TIERRA a CI-111 Ⓖ.
(6) Encender el interruptor de la fuente de energía del tocadiscos.
(7) Escuchar la audición de la pista 6.
(8) Fijar el tocadiscos en el modo de audición como muestra la Fig. 5-4, con cuidado de no causar vibración en la unidad transversal.

(9) Quitar la PCI del circuíto de servo tal como se muestra in la Fig. 5-5 comprobar que los dos tornillos de ajuste de la parte inferior del captador están en la parte de fuera de la TCI del motor de vástago.
Si están en un alcance de ajuste difícil, mover el captador óptico hacia fuera en el modo de rastreo de salto.
(10) Desconectar los conectores del circuíto de servo (CN101, CN102 y CN103).
(11) Verificar si la onda de señal RF está como en la Fig. 5-8. Si no se puede verificar la forma de onda o es diferente a la de la figura, seguir los pasos que van a continuaci'on.
(SZZP1044C.....1,5mm)
(12) Fijar la llave allen en el cabezal de los tornillos de ajuste mecánico que se muestran en la Fig. 5-5 y hacerlos girar hacia la derecha o la izquierda hasta conseguir la mejor posición.
Tener cuidado con el cable flexible que viene del captador óptico.
(13) Apagar el interruptor de la fuente de energía del tocadiscos.
(14) Después del ajuste, disponer los componentes C111, C128, C137, C139 y C146 para que queden planos en la TCI del circuíto de servo y volver a armar la unidad transversal, como muestra la Fig. 5-7.
(15) Unir correctamente los conectores de cada uno de los interruptores de detección al circuíto de servo. (Si la conexión está mal hecha, el circuíto de fuente de energía y el de servo se pueden dañar.)
Una vez completado el ajuste del captador óptico, fijar el aparato de manera que se pueda verificar la conexión con la fuente de energía como se ve en la Fig. 5-4 y se pueda realizar el ajuste eléctrico.

– MEMO –

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Technical Information

MODEL SL-PJ11, SL-P100, SL-P300, SL-P500

SUBJECT **IMPROVEMENT PROCEDURE OF PLAYABILITY**

COMPACT disc DIGITAL AUDIO DIGITAL

Compact Disc Player

CONTENTS

1).Improvement procedure of playability PART-1
2).Improvement procedure of playability PART-2

[NOTE]

1). **In case of repair of sound skip or noise, please follow the step mentioned in the improvement procedure of playability PART-1, most problem can be solved by this method.**

2).If it is not good enough, please proceed PART-2 to improve the playability.

3).SL-PJ33 ..... Please refer to this manual from page 35-20 for adjustment,However original service manual has old adjustment procedure.

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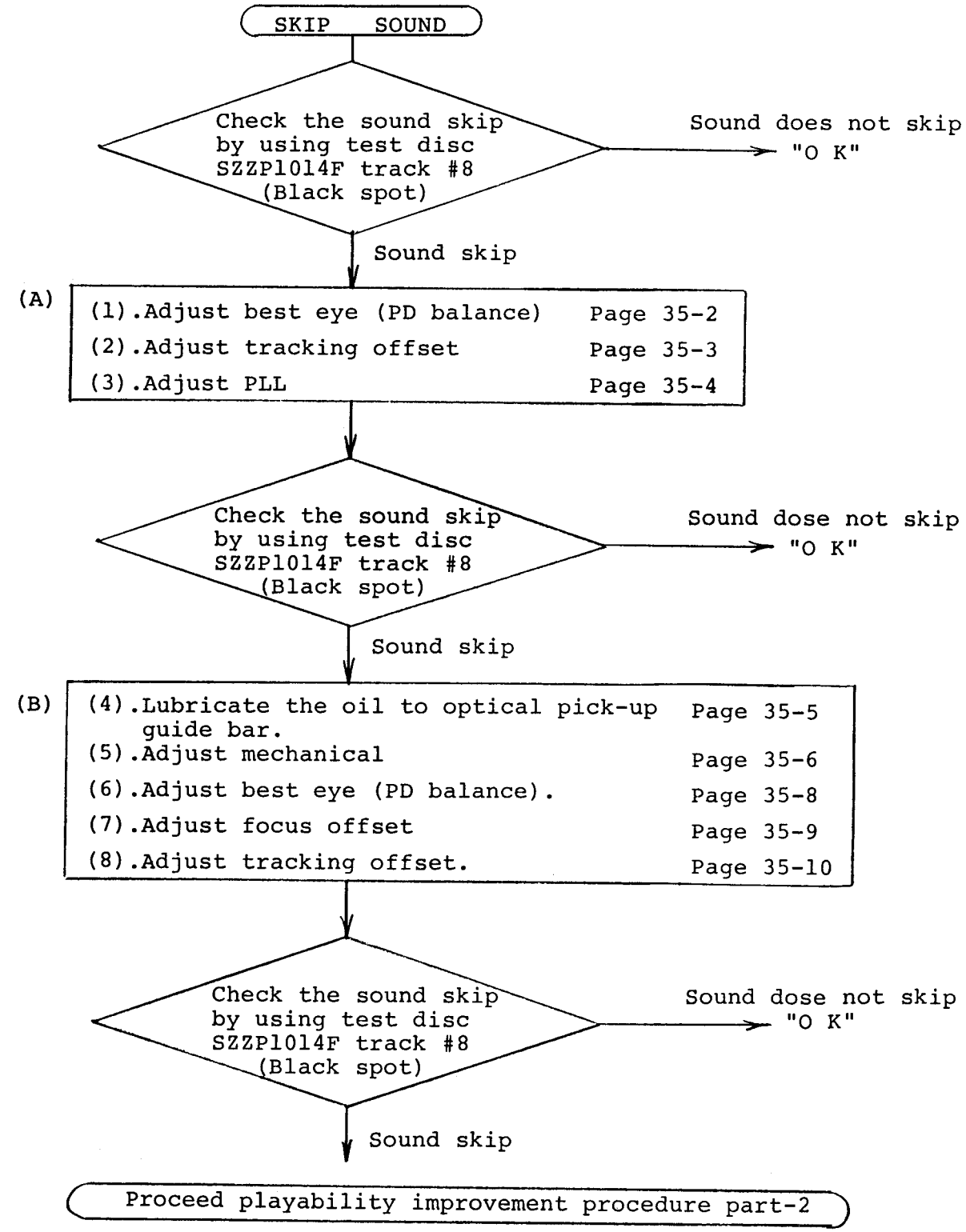
Procedure to improve playability

Model. SL-PJ11, SL-P100, SL-P300, SL-P500

Symptom Sound skip or noise occurs during playback.

Repair method Carry out repair by following procedure.

1).Process must be kept in order.
2).Almost every fault should be cured.
3).In case this (A) and (B) method is not enough, please proceed PART-2 procedure.


SKIP SOUND
Check the sound skip by using test disc SZZP1014F track #8 (Black spot)
Sound does not skip "O K"
Sound skip
(A)
(1).Adjust best eye (PD balance) Page 35-2
(2).Adjust tracking offset Page 35-3
(3).Adjust PLL Page 35-4
Check the sound skip by using test disc SZZP1014F track #8 (Black spot)
Sound dose not skip "O K"
Sound skip
(B)
(4).Lubricate the oil to optical pick-up guide bar. Page 35-5
(5).Adjust mechanical Page 35-6
(6).Adjust best eye (PD balance). Page 35-8
(7).Adjust focus offset Page 35-9
(8).Adjust tracking offset. Page 35-10
Check the sound skip by using test disc SZZP1014F track #8 (Black spot)
Sound dose not skip "O K"
Sound skip
Proceed playability improvement procedure part-2

PART 1

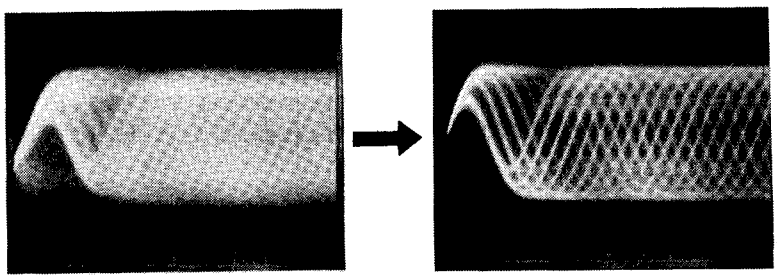
NO.1 Best eye (PD Balance) adjustment

Model. SL-PJ11,SL-P100, SL-P300, SL-P500

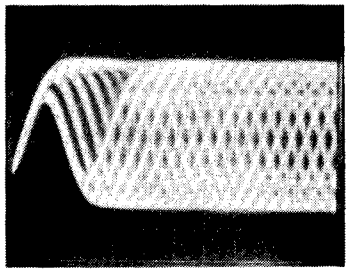
(1) Connect CH-1 of the oscilloscope to the terminal C305 on the digital module PCB and the grounding terminal of IC-11 (G) of the model SL-PJ11. or TJ701 (+) and TJ703 on the main PCB of the model SL-P100, SL-P300, and SL-P500.

Oscilloscope settinf
- Sweep..... 0.5 µsec
- Volt..... 500 mv
- Input selector .... AC

(2) Turn ON the power supply switch of the player.
(3) Place the test disc "SZZP1014F" or "SZZP1054C" in to the disc holder.
(4) The player to the playback mode.
(5) Play to track #1 of the test disc "SZZP1014F" or .
(6) Adjust VR101 so that the eye pattern of RF signal is stretched most as shown Fig,1-24 to Fig,1-25 "OK".
(7) Turn off the power supply switch of the player.



Fig,1-24



OK

Fig,1-25

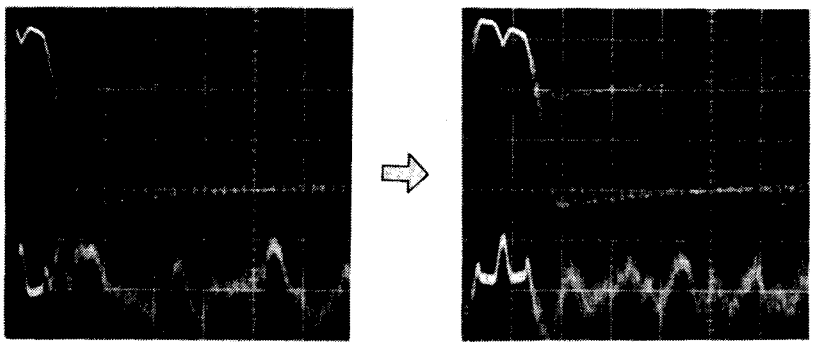
NO.2 Tracking offset adjustment

Model. SL-PJ11, SL-P100, SL-P300, SL-P500

(1) Connect CH-1 of the oscilloscope to the terminal C305 on the digitan module PCB and CH-2 to the terminal TJ101 on the servo circuit PCB, and connect GND of the oscilloscope to the IC-11 (G) point on the main PCB of the model SL-PJ11.
or connect CH-1 of the oscilloscope to the TJ701 (+) and TJ703 (-) to the main PCB and connect CH-2 to TJ101 of the servo circuit PCB of the model SL-P100, SL-P300 and SL-P500.

		C305	TJ101	TJ701	TJ101
Oscilloscope setting	Sweep	0.5msec		0.5msec	
	Volt	500 mv	100 mv	500 mv	100 mv
	Input	AC	DC	AC	DC
	Mode	NORM triggering CH-1			

(2) Turn ON the power supply switch of the player.
(3) Place the test disc "SZZP1057C" in to the disc hplder.
(4) The player to the playback mode.
(5) Play the track #3 of the test disc.
(6) Check the waveform of CH-1 and CH-2 on the oscilloscope and adjust VR103 so that the waveforms around the triggering point shall be as shown Fig,1-27.
(7) Turn OFF the power supply switch of the player.



Fig,1-27

NO.3 PLL adjustment

Model. SL-PJ11, SL-P100, SL-P300, SL-P500

(1) Connect CH-1 of the oscilloscope to the terminal C803 or C804 of the model SL-PJ11, or to the terminal R809 of the model SL-P100, SL-P300 and SL-P500 of the main PCB and the terminal GND to the chassis.

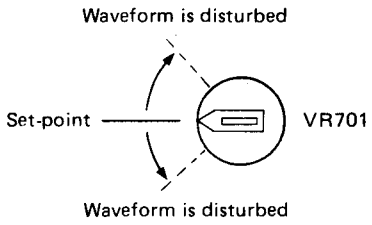
Oscilloscope setting	Sweep	1.0 msec
	Volt	1.0 v
	Input selector	DC

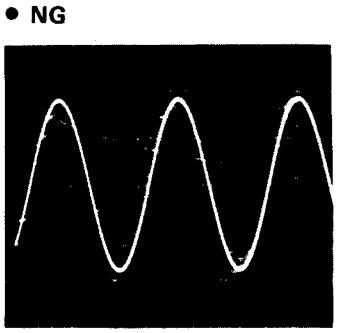
(2) Turn ON the power switch of the player.
(3) Place the test disc "SZZP1054C" in to the disc holder.
(4) The player to the playback mode.
(5) Play the track #6 of the test disc.
(6) Check the waveform on the oscilloscope and adjust VR701 in the following step.

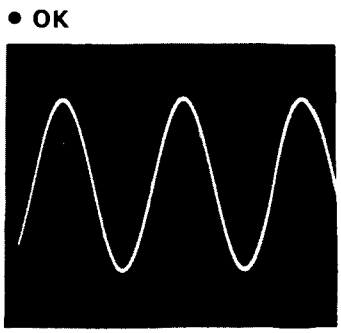
a. Turn VR701 upwards slowly and learn the point at which the waveform on the oscilloscope begings to be disturbed as shown Fig,1-28 "NG".
b. Turn VR701 downwards slowly (opposite direction to that in the above para 'a') and learn the point at which the waveform on the oscilloscope begings to be disturbed.
c. Set the VR701 in the middle position between the points learned in the above steps "a" and "b".

(7) Turn OFF the power supply switch of the player.

Example:







Fig,1-28

NO.4 Lubricating oil to guide bar

PART-1 (B)

Model SL-PJ11, SL-P100, SL-P300, SL-P500

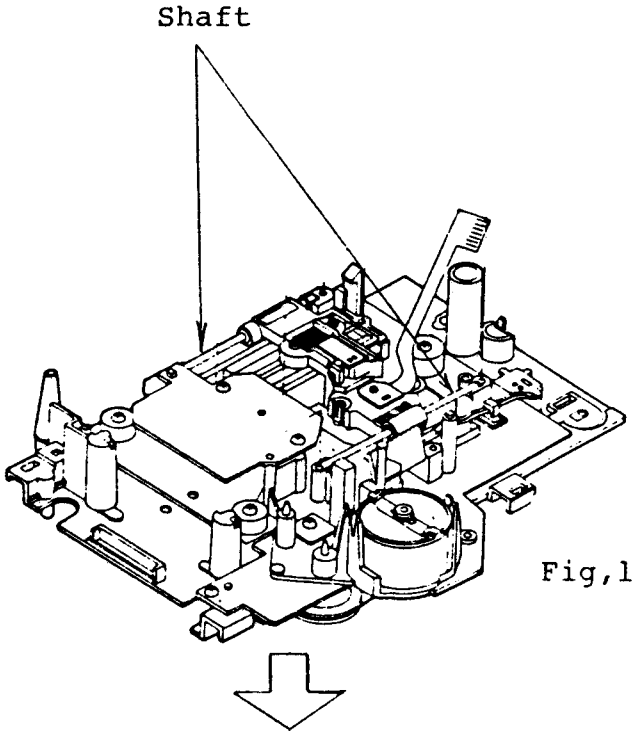
Content Improvement of playability

Repair method

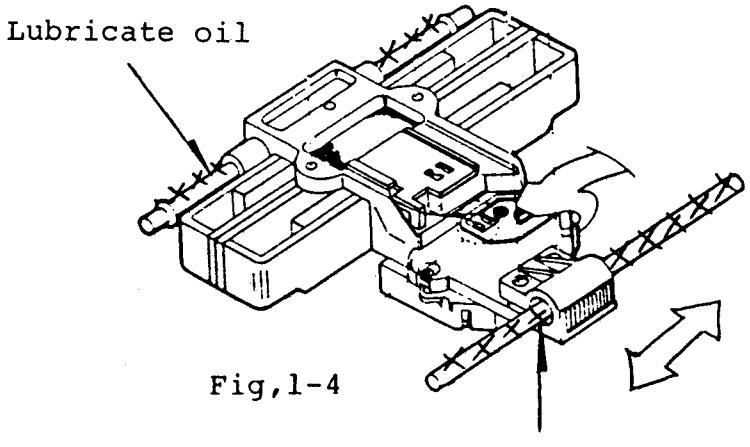
Lubricate oil "SZZOL29 (swa fluid #100) to guide bar.

[Note]

To make more smooth movement on optical pick-up.



Fig,1-3



Fig,1-4

[Note]

1. Disassemble the player with care according to the disassembly procedure outlined in the service manual.
2. Dip the cotton swab in the oil and lubricate to the bars, then make a movement the optical pick-up to direction as shown Fig,1-4.

NO.5 Mechanical adjustment

Model SL-PJ11

(1) Turn ON the power supply switch of the player.
(2) Insert the test disc "SZZP1056C" in the disc holder.
(3) Turn OFF the power supply switch of the player.
(4) Set the oscilloscope as satted below.

Oscilloscope setting	Sweep	0.5 μsec
	Volt	0.5 v
	Input selector ...	AC

(5) Connect CH-1 of the oscilloscope to C305 on the LSI module and GND to the IC-11 (G).
(6) Turn on the power supply switch of the player.
(7) Playback the track #3.
(8) Set the player in the playback mode as shown Fig,1-16 with care not to give vibration to the traverse unit.
(9) Remove the servo circuit PCB as shown in Fig,1-17 and check whether or not the two mechanical adjusting screws located on the underside of the potical pick-up are it should be outside the spindle PCB.
If they are not located in a adjustable range, move to optical pick-up outwards by the skip search mode.
(10) Disconnect the servo circuit connectors CN101, CN102 and CN103.
(11) Check if the RF signal waveform as shown Fig,1-20. If the waveform can not be checked or is unlike the given waveform. proceed to the following steps.
(12) Set the allen wrench "SZZP1044C" into the socket in the heads of the mechanical adjusting screws as shown Fig,1-18 and turn the screws right or left to optimum positions, plaese pay attention to the flexible cord from the optical pick-up.
[note]
a. Hexagonal wrench screw driver SZZP1044C
b. Adjust the adjusting screws to make eye pattern at most stretched point as shown Fig,1-21.

(13) Turn OFF the power supply switch of the player.
(14) After adjustment dress components C111, C128, C137, C139 and C146 to lay flat on servo circuit PCB and reassemble on the traverse unit.
(15) Be sure to lock the adjusting screw by lock paint like a nail paint as shown Fig,1-18.
(16) Connect the connectors of the each detection switches to the servo circuit correctly.
(If connected wrong position, the power supply circuit and the servo circuit may become faulty.)

On completion of adjusting the potical pick-up set the player so that it can be power ON checked as shown Fig,1-16 and must conduct electric adjustment.

[Cautions]
a. Take care not to damage the flexible cord of optical pick-up during adjustment.
b. Before installing the servo PCB make sure that the condenser on the board is laid down.

(1).Connect the oscilloscope to TJ701 (+) and TJ703 (-) of the main PCB.

Oscilloscope setting	Sweep	:0.5 μsec
	Volt	:0.5 v
	Input selector	:AC

(2).Turn on the power switch and mount the uneven test disc "SZZP1056C"

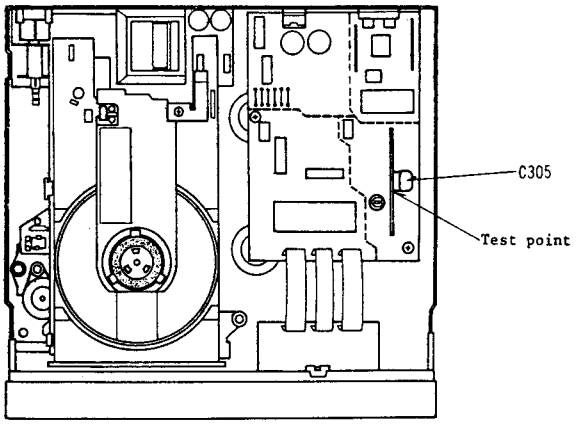
(3).**Play to track #3.**

(4).Set the unit as shown Fig,1-16 with care not to give vibrations to the loading unit.

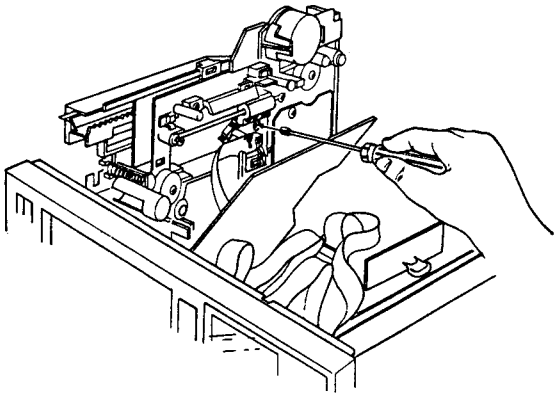
(5).Pull out the connectors CN101, CN102, CN103 of the servo PCB.

(6).Alternately turn the optical pick-up adjusting screws with hexagonal wrench "SZZP1044C" so that the eye pattern of the waveform "RF SIGNAL" of the oscilloscope is widest open as shown Fig,1-20.

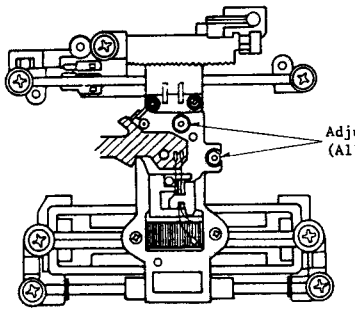
(7).At the end of adjustment, playback the test disc "SZZP1014F" track No.6 and confirm the RF signal,it should be Fig,1-21.



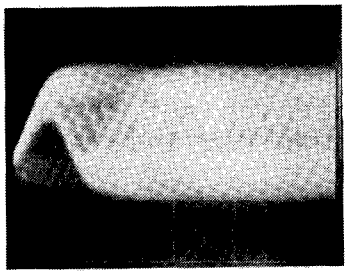
Fig,1-16



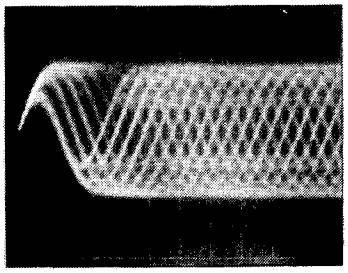
Fig,1-17



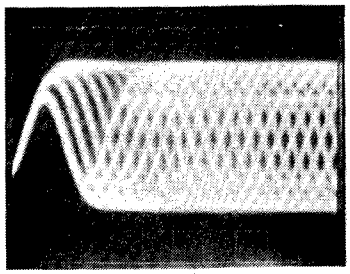
Fig,1-18



Fig,1-19



Fig,1-20



OK Fig,1-21

※ Repeat to turn the adjusting screw in order to get best RF signal condition (Most stretched eye pattern)

※ Put the lock paint at screws after adjustment.

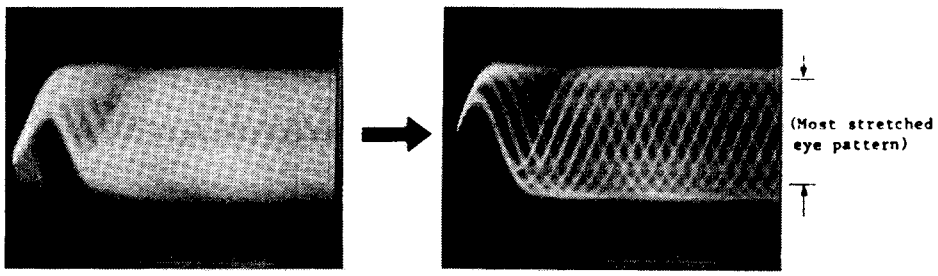
NO.6 Best eye (PD Balance) adjustment

Model. SL-PJ11,SL-P100, SL-P300, SL-P500

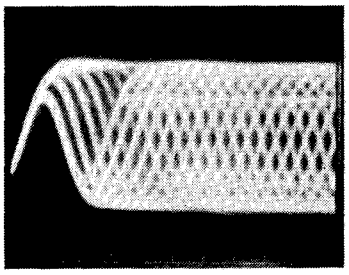
(1).Connect CH-1 of the oscilloscope to the terminal C305 on the digital module PCB and the grounding terminal of IC-11 G of the model SL-PJ11. or TJ701 (+) and TJ703 on the main PCB of the model SL-P100, SL-P300, SL-P500.

Oscilloscope setting	Sweep	: 0.5 μsec
	Volt	: 500 mv
	Input selector	: AC

(2).Turn ON the power supply switch of the player.
(3).**Place the test disc "SZZP1014F" or "SZZP1054C" in to the disc holder.**
(4).The player to the playback mode.
(5).**Play to track #1 of the test disc "SZZP1014F" or "SZZP1054C".**
(6).Adjust VR101 so that the eye pattern of RF signal is stretched most as shown Fig,1-24.
(7).Turn OFF the power supply switch of the player.



Fig,1-24



OK

Fig,1-25

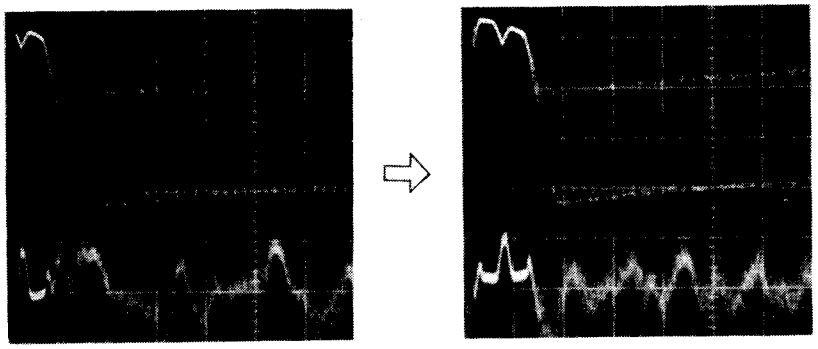
NO.7 Focus offset adjustment

Model. SL-PJ11, SL-P100, SL-P300, SL-P500

(1).Connect CH-1 of the oscilloscope to the terminal C305 on the digital module PCB and CH-2 to the terminal TJ102 on the servo circuit PCB and connect GND of the oscilloscope to the IC-11 ground point on the main PCB of the model SL-PJ11.
or connect CH-1 of the oscilloscope to TJ701 (+) and TJ703 (-) to the main PCB and connect CH-2 to the TJ102 of the servo circuit PCB of the model SL-P100, SL-P300, SL-P500.

		C305	TJ102	TJ701	TJ102
Oscilloscope setting	Sweep	:0.5msec		0.5msec	
	Volt	:500mv	100mv	500mv	100mv
	Input	:AC	DC	AC	DC
	Mode	:NORM	Triggering	CH-1	

(2).Turn ON the power supply switch of the player.
(3).Place the test disc "SZZP1057C" in to the disc holder by open/close key.
(4).The player to the playback mode.
(5).**Play to track #3 of the test disc "SZZP1057C".**
(6).Check the waveform of CH-1 and CH-2 on the oscilloscope and adjust VR105 so that the waveform around the triggering point shall be shown Fig,1-26.



Fig,1-26

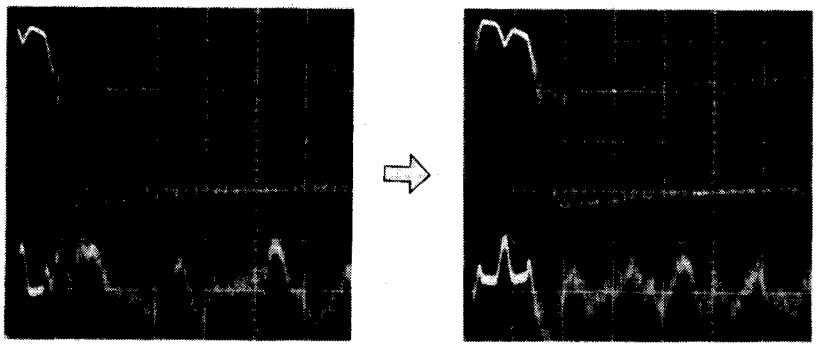
NO.8 Tracking offset adjustment

Model. SL-PJ11, SL-P100, SL-P300, SL-P500

(1).Connect CH-1 of the oscilloscope to the terminal C305 on the digital module PCB and CH-2 to the terminal TJ101 on the servo circuit PCB, and connect GND of the oscilloscope to the IC-11 ground point on the main PCB of the model SL-PJ11.
or Connect CH-1 of the oscilloscope to the TJ701 (+) and TJ703 (-) to the main PCB and connect CH-2 to TJ101 of the servo circuit PCB of the model SL-P100, SL-P300, and SL-P500.

		C305	TJ101	TJ701	TJ101
Oscilloscope setting	Sweep	:0.5msec		0.5msec	
	Volt	:500mv	100mv	500mv	100mv
	Input	:AC	DC	AC	DC
	Mode	:NORM triggering		CH-1	

(2).Turn on the power switch of the player.
(3).Place the test disc "SZZP1057C" in to the disc holder by open/close key
(4).The player to the playback mode.
(5).**Play to track #3 of the test disc "SZZP1057C".**
(6).Check the waveform of CH-1 and CH-2 on the oscilloscope and adjust VR103 so that the waveform around the triggering point shall be shown Fig,1-27.



Fig,1-27

PART 2 IMPROVEMENT PROCESS OF PLAYABILITY

Model SL-PJ11, SL-P100, SL-P300, SL-P500

Symptom Sound skips when the track No8, No9 and No10 of Technics test disc(SZZP1014F) are played back.

- Track No.8 ..... Black band 0.5mm
- Track No.9 ..... Wedge 0.7mm
- Track No.10 ..... Finger Print

Repair Method

Please carry out the following all countermeasure and adjustment procedure step by step.

1. Replace 4 divided photo detector type optical pick-up with 6 divided photo detector type one ..... Page 35-13
2. Lubricate oil to guide bar for optical pick-up ..... Page 35-14
3. Add the tracking offset compensation PCB ..... Page 35-16
4. Add the nylon washer to traverse base ..... Page 35-14
5. Add the capacitor to PLL circuit ..... Page 35-19
6. Set the servo alignment VR at initial position ..... Page 35-20
7. Turntable hight adjustment ..... Page 35-20
8. Mechnical adjustment ..... Page 35-22
9. Focus gain adjustment ..... Page 35-24
10. Tracking gain adjustment ..... Page 35-25
11. Best eye (PD Balance) adjustment ..... Page 35-26
12. Focus offset adjustment ..... Page 35-27
13. Tracking offset adjustment ..... Page 35-28
14. PLL adjustment ..... Page 35-29
15. Tracking balance adjustment ..... Page 35-30
16. Confirmation of playability (Confirm with Technics test disc "SZZP1014F") ..... Page 35-34

Playability improvement kit

Kit parts number SZZP1052C

(Items)

1). Tracking offset compensation PCB	SXPD530	1
2). PCB holder	SHRD16	1
3). Oil (swa fluid #100)	SZZOL29	1
4). Nylon washer	SHWD6	4
5). Ceramic capacitor	ECKF1H103KB	1
	ECEA1HU4R7	1
6). Filter ass'y	SZZP1053C	1
•Connector	EMCHUM0501W	1
•Resistor	ERD25FJ473	1
•Capacitor	ECEA1N220S	1
7). 6 divided optical pick-up	SOAD20A	1

Test disc information

1). Test disc 1 ..... SZZP1014F (CDT-002)

2). Test disc 2 .....SZZP1054C (CDT-016)

3). Uneven disc for mechanical adjustment ..SZZP1056C

4). Black band test disc SZZP1057C

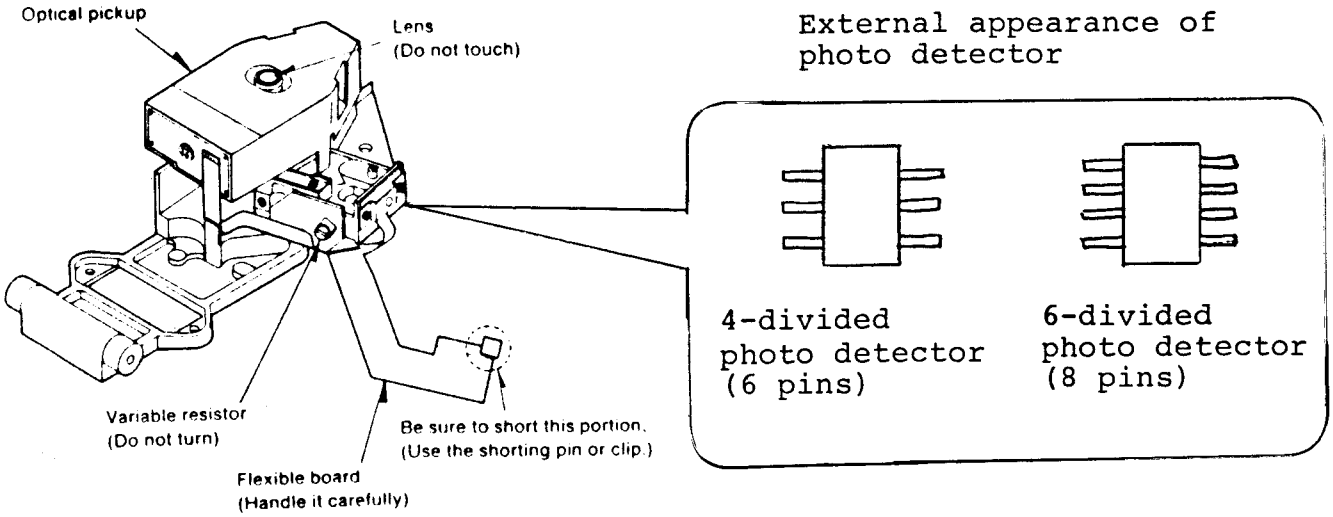
NO.1 Replacing into 6 divided type optical pick-up

Replace 4-divided type optical pick-up with 6-divided type one

Reason for replace

Improvement of playability against small scratch

How to judge



Fig,1-1

Parts Number : SOAD20A

[Note]

Parts No is same between 4-divided photo detector type and 6-divided photo detector type, please judge as following method.

Interchangeable

It is interchangeable between 4-divided photo detector and 6-divided photo detector.

[Cautions while replacing optical pick-up]

- Pay carefull attention to the flexible PCB led from the optical pick-up when the PCB of the optical servo circuit is removed.
- Must short-circuit the flexible PCB when the flexible PCB is disconnected from CN106.
- Please refer to service manual for details.

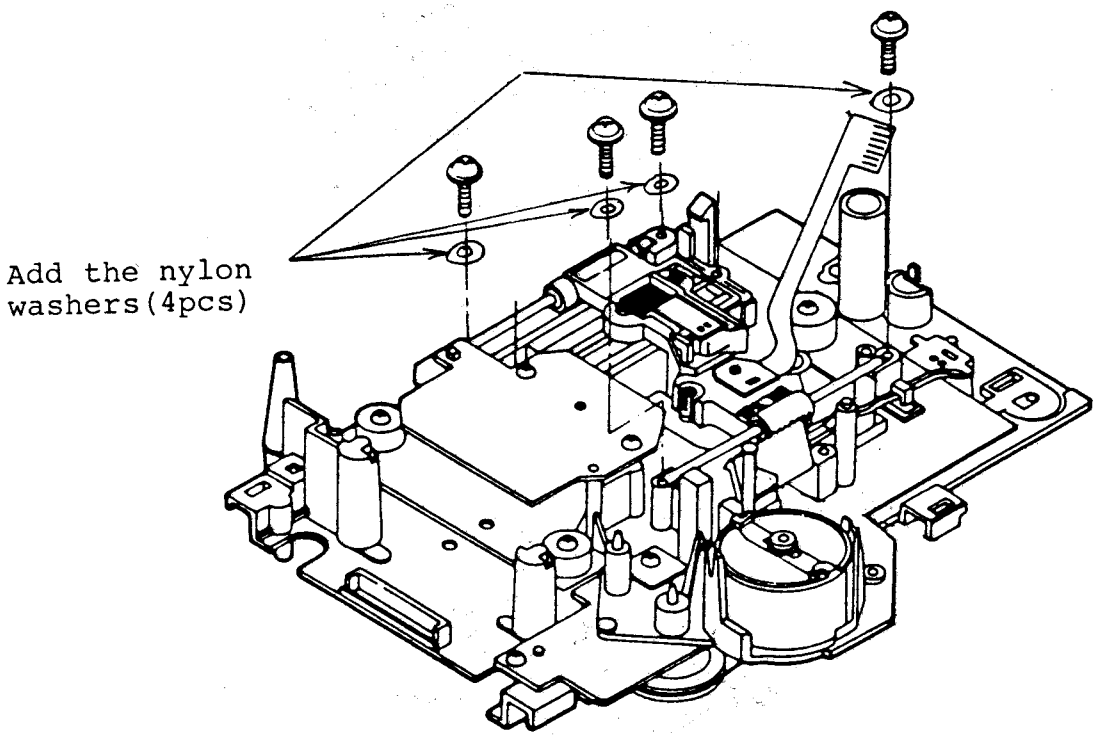
NO.2 Addition of nylon washer to the traverse base

Repair method

Add the nylon washer "SHWD6" 4 pcs as shown Fig,1-2.

Purpose

Reduce a warp of the traverse base and tilt of optical pick-up unit become stable.



Fig,1-2

NO.3 Lubricating oil to guide bar

Model SL-PJ11, SL-P100, SL-P300, SL-P500

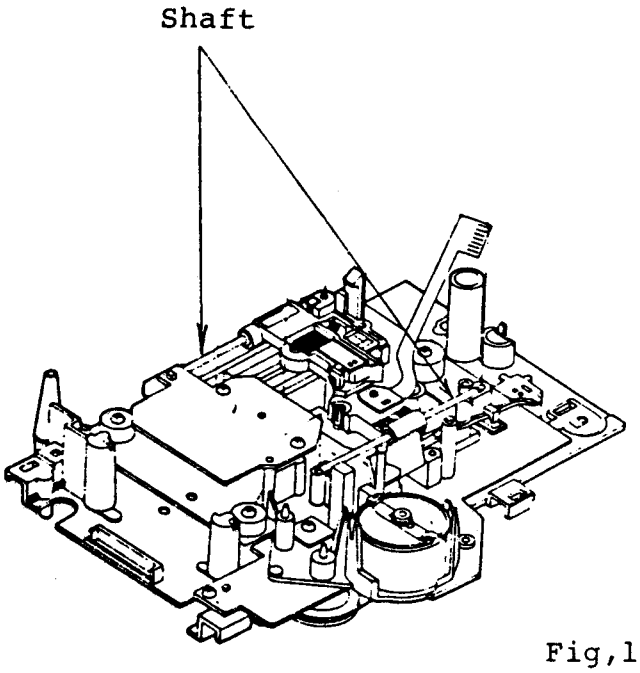
Content Improvement of playability

Repair method

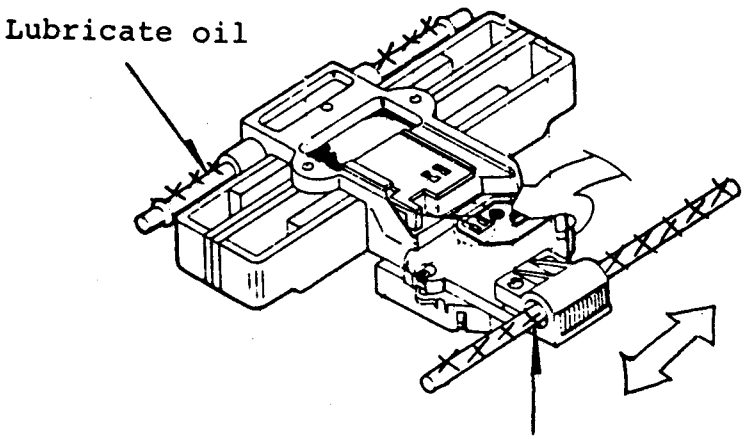
Lubricate oil "SZZOL29" (swa fluid #100) to guide bar.

[Note]

To make more smooth movement on optical pick-up.



Fig,1-3



Fig,1-4

[Note]

1. Disassemble the player with care according to the disassembly procedure outlined in the service manual.
2. Dip the cotton swab in the oil and lubricate to the bars, then make a movement the optical pick-up to direction as shown Fig,1-4.

NO.4 Addition of the tracking offset compensation PCB

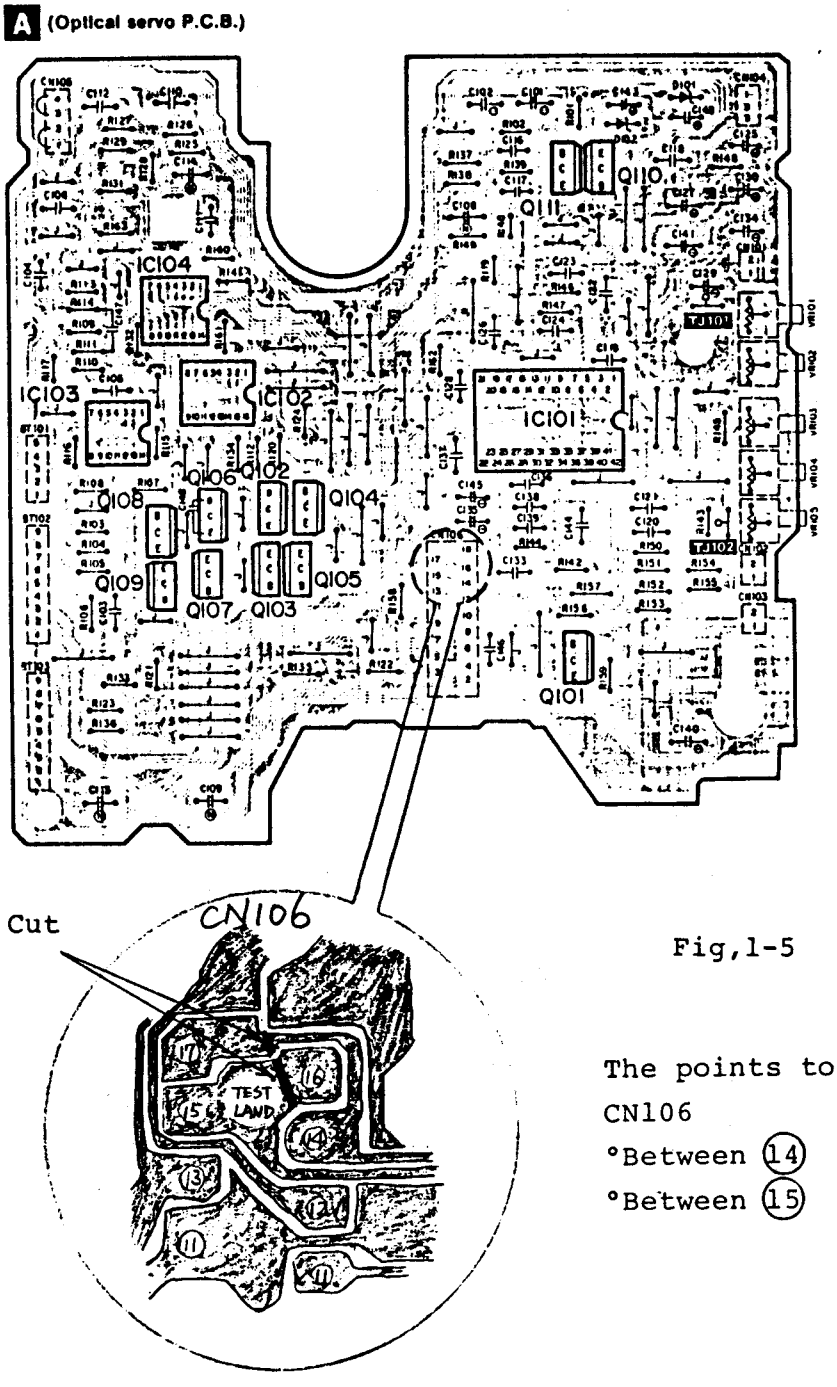
Model SL-PJ11, SL-P100, SL-P300, SL-P500

Repair method

Add the tracking offset compensation PCB by following process.

(Parts required)
- Tracking offset compensation PCB SXPD530
- PCB holder SHRD16

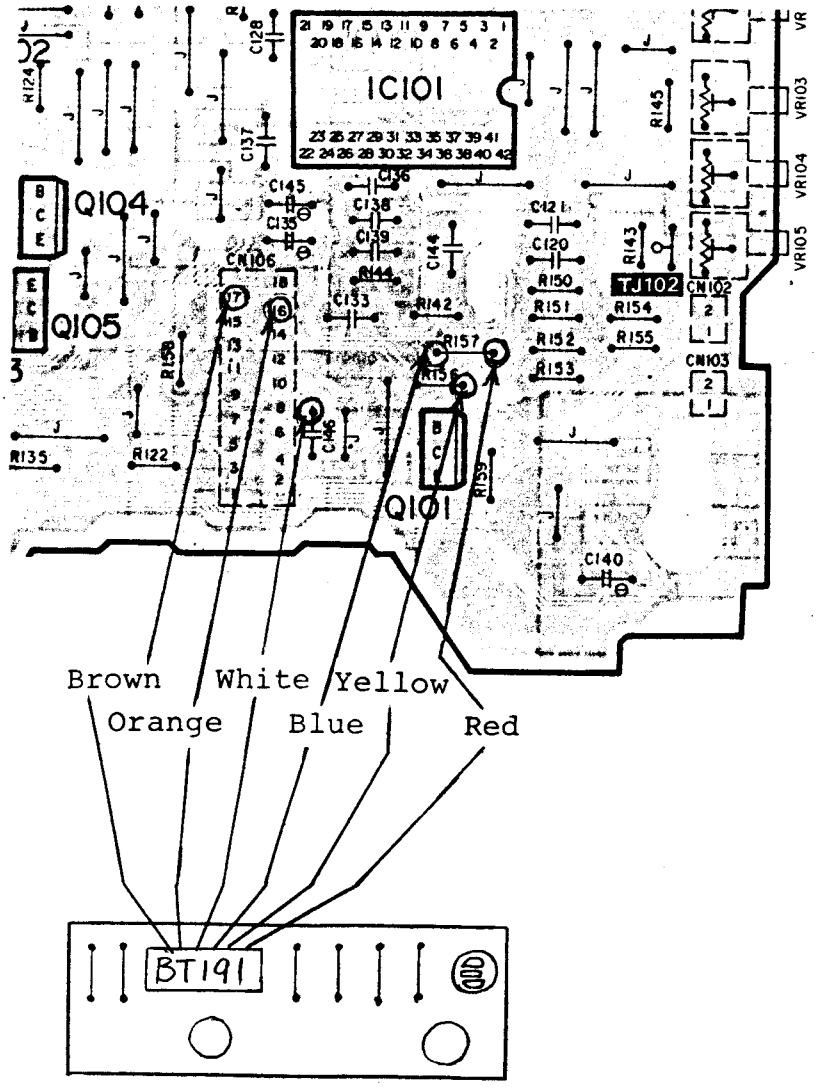
[1]. The following two points to be cut by knife etc on optical servo PCB as shown Fig, 1-5.



Fig,1-5

The points to be cut
CN106
- Between (14) - (17) pin
- Between (15) - (16) pin

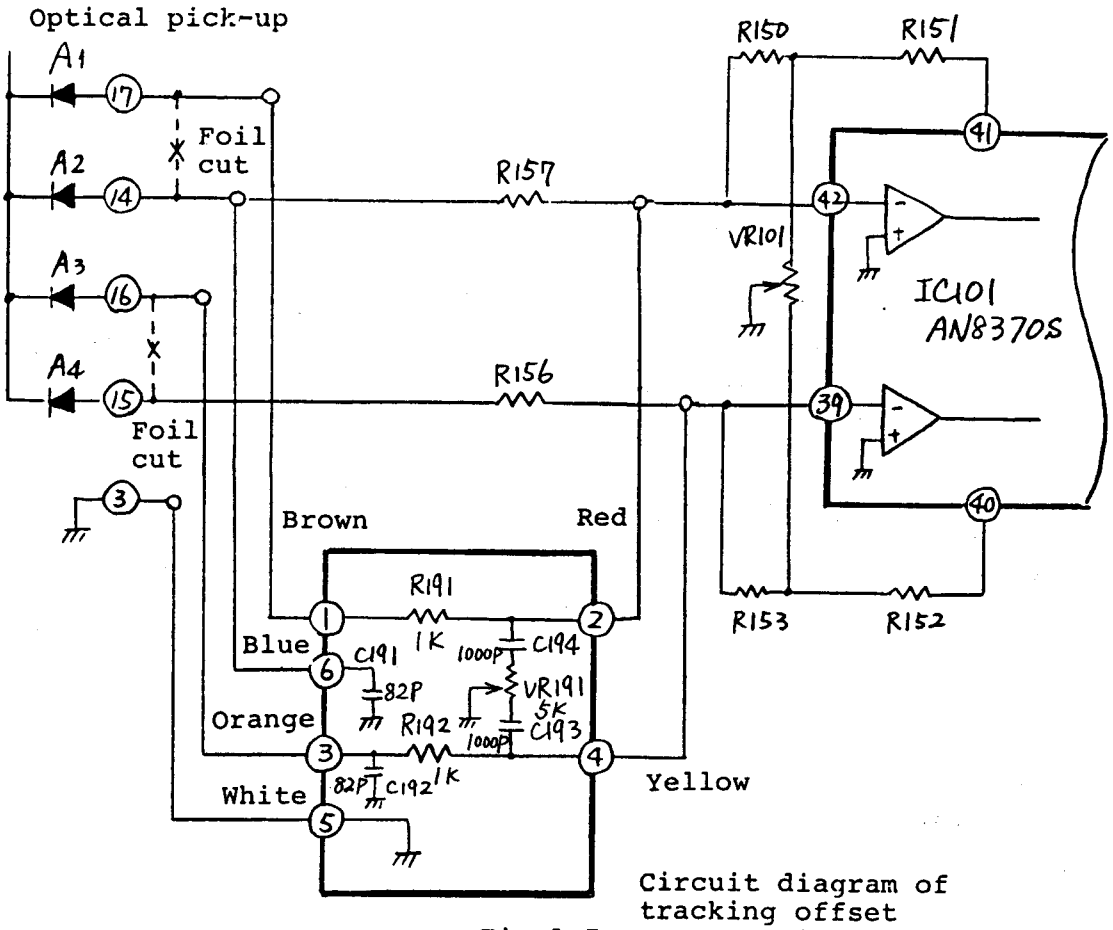
[2]. Solder the 6 wires on tracking offset compensation PCB to the each point mentioned below on optical servo PCB as shown Fig, 1-6.



Tracking offset compensation PCB

Fig,1-6

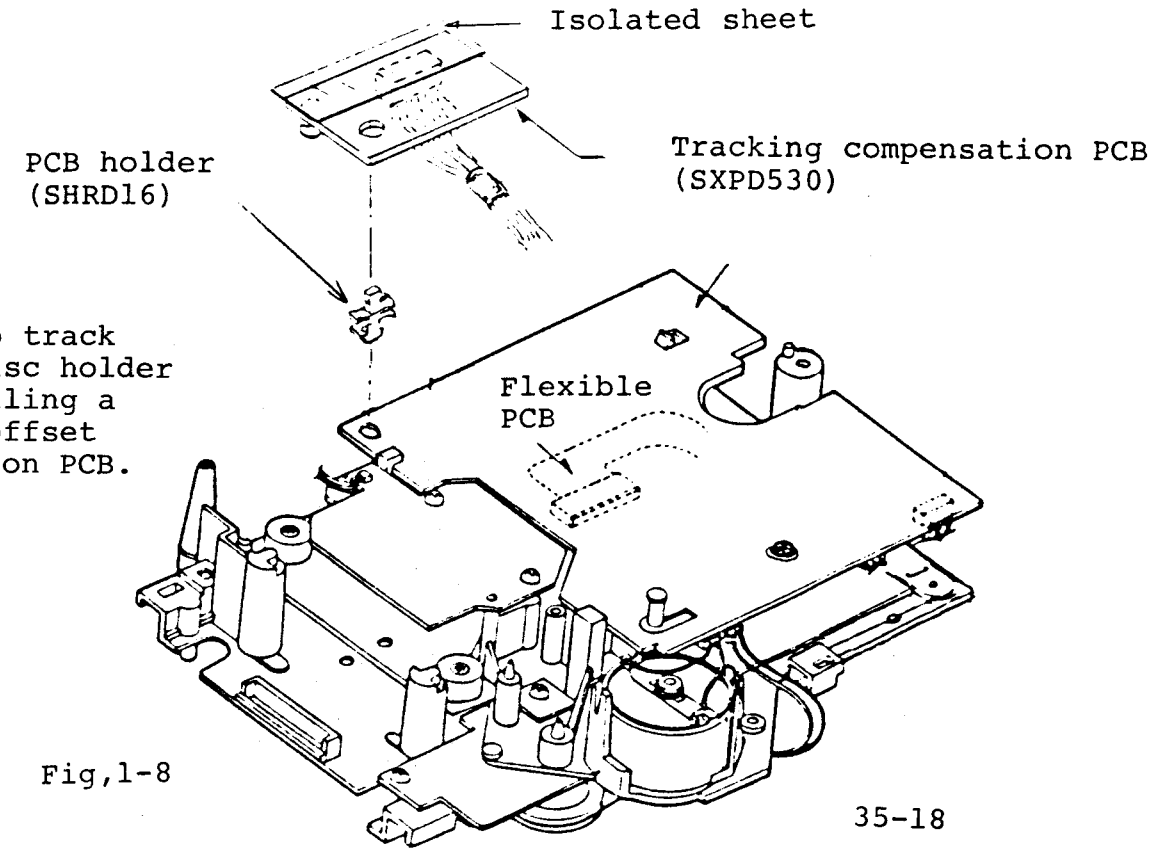
Tracking PCB connector NO	Optical Servo PCB
BT191-1 Brown	Connector CN106 pin 17
2 Red	Resistor R157 right side
3 Orange	Connector CN106 pin 16
4 Yellow	Resistor R156 right side
5 White	Capacitor C146 IC-101 side
6 blue	Resistor R157 left side



Circuit diagram of tracking offset compensation PCB

Fig,1-7

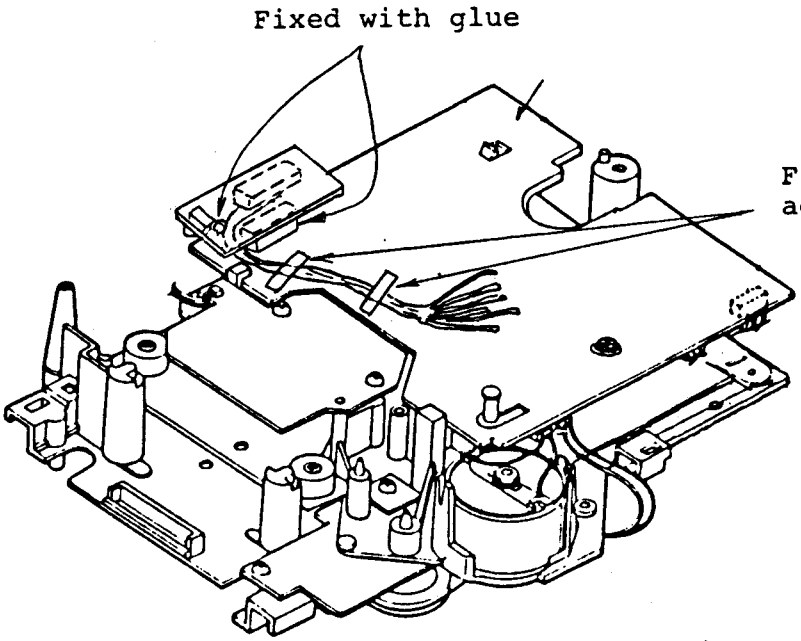
[3]. Install a tracking offset compensation PCB to the hole of optical servo PCB with PCB holder as shown Fig,1-8.



[Note]
No need to track out the disc holder for installing a tracking offset compensation PCB.

Fig,1-8

[4]. Fixed and dispose wires as a following as shown Fig,1-9 after installing a tracking compensation PCB.



Fig,1-9

NO.5 Addition of capacitor to the PLL circuit

Model SL-PJ11, SL-P100, SL-P300, SL-P500

Purpose

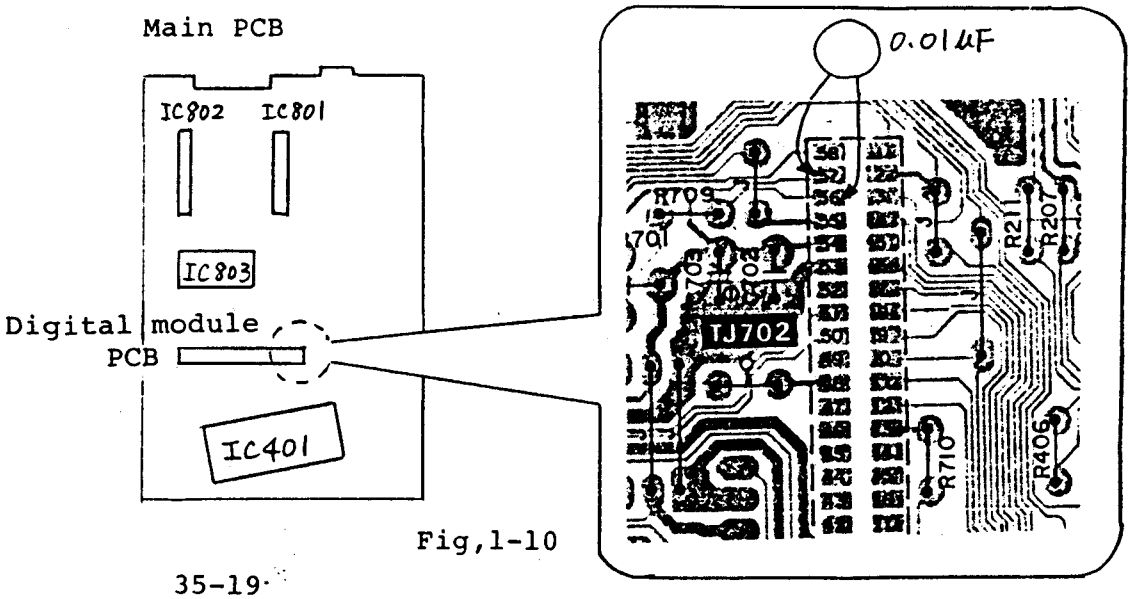
Improvement of playability
(Sound skip or noise is generated even if PLL adjustment is done by 0.5mm black band correctly)

Repair method

[1].Add the capacitor 0.01μF "ECKF1H103KB" at pin 56 and 57 of digital module pin on the main PCB as shown Fig,1-10.

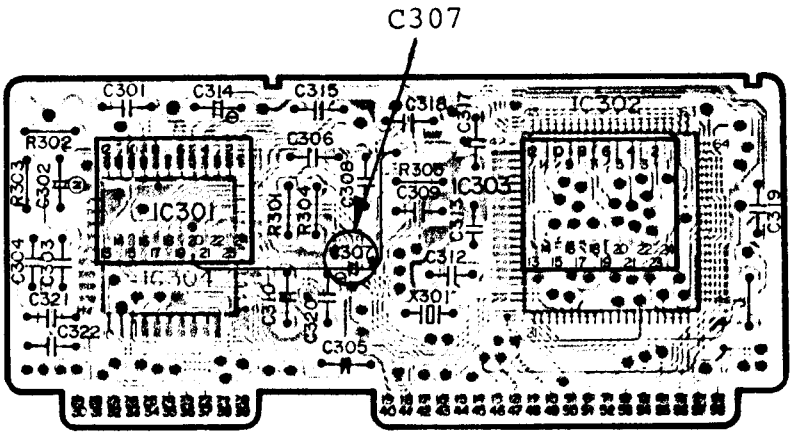
(Note)

Be sure to make PLL adjustment after adding of the capacitor.



Fig,1-10

[2].Replace the capacitor C307 of digital module as shown Fig,1-11



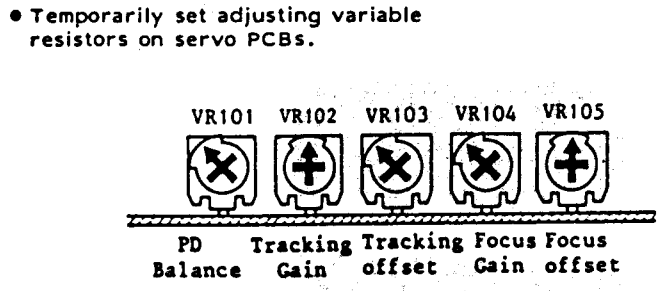
"ECEA1HUR47" 0.047uF

"ECEA1HU4R7" 4.7uF

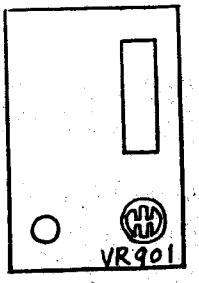
Fig,1-11

NO.6 Initial setting points of adjusting variable resistor

° Temporarily set adjusting variable resistors on servo PCB and tracking offset compensation PCB as shown Fig,1-12.



Fig,1-12



Tracking offset compensation PCB

NO.7 Turntable height adjustment

(1).Turn on the power supply switch of the player.
(2).Place the test disc "SZZP1014F" or "SZZP1054C" to the disc holder.
(3).Turn off the power supply switch of the player.
(4).Set the oscilloscope to DC zero balance.
(5).Connect the CH-1 of the oscilloscope to TJ102 (SL-PJ11)or TJ102 (SL-P100,SL-P300, SL-P500) of the servo circuit and GND to the chassis.

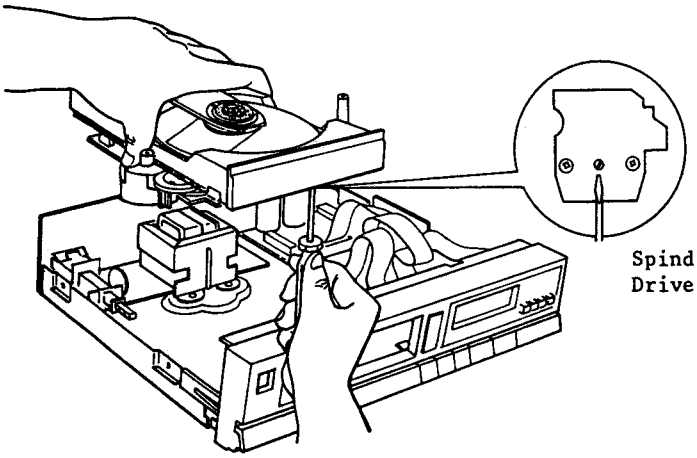
Oscilloscope setting
Sweep : 5 msec
Volt : 100 mv
Input selector : DC

(6).Turn on the power supply switch of the player.
(7).Play to track #1 of the test disc"SZZP1014F"or"SZZP1054C".
(8).Hold the traverse unit by the hands as shown Fig,1-13 with care not to give vibration to the traverse unit.
(9).Turn the adjusting screw on the underside of the spindle motor PCB by a flat screwdriver, so that the waveform at TJ102 (SL-PJ11) or TJ102 (SL-P100, SL-P300, SL-P500) shall be 0 ± 50mv as shown Fig,1-15.
(10).Turn off the power supply switch of the player

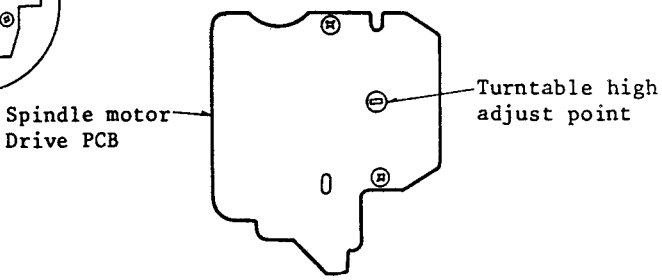
(11).Lock the adjusting screw with "Lock paint" like a nail paint or bond on completion of adjustment.

[Note]

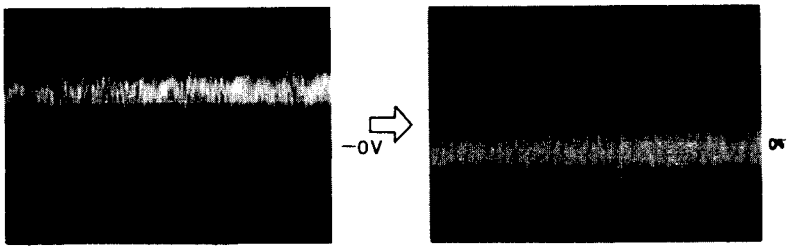
Adjust turntable height by playing attention to the adjusting screw because the screw is plastic, replace the screw "SNSD3" if the screw is defected.



Fig,1-13



Fig,1-14



Fig,1-15

NO.8 Mechanical adjustment

Model SL-PJ11

(1) Turn ON the power supply switch of the player.
(2) Insert the test disc "SZZP1056C" in the disc holder.
(3) Turn OFF the power supply switch of the player.
(4) Set the oscilloscope as satted below.

Oscilloscope setting	Sweep	0.5 μsec
	Volt	0.5 v
	Input selector ...	AC

(5) Connect CH-1 of the oscilloscope to C305 on the LSI module and GND to the IC-11 (G).
(6) Turn on the power supply switch of the player.
(7) Playback the track #3.
(8) Set the player in the playback mode as shown Fig,1-16 with care not to give vibration to the traverse unit.
(9) Remove the servo circuit PCB as shown in Fig,1-17 and check whether or not the two mechanical adjusting screws located on the underside of the potical pick-up are it should be outside the spindle PCB.
If they are not located in a adjustable range, move to optical pick-up outwards by the skip search mode.
(10) Disconnect the servo circuit connectors CN101, CN102 and CN103.
(11) Check if the RF signal waveform as shown Fig,1-20. If the waveform can not be checked or is unlike the given waveform. proceed to the following steps.
(12) Set the allen wrench "SZZP1044C" into the socket in the heads of the mechanical adjusting screws as shown Fig,1-18 and turn the screws right or left to optimum positions, plaese pay attention to the flexible cord from the optical pick-up.
[note]
a. Hexagonal wrench screw driver SZZP1044C
b. Adjust the adjusting screws to make eye pattern at most stretched point as shown Fig,1-21.

(13) Turn OFF the power supply switch of the player.
(14) After adjustment dress components C111, C128, C137, C139 and C146 to lay flat on servo circuit PCB and reassemble on the traverse unit.
(15) Be sure to lock the adjusting screw by lock paint like a nail paint as shown Fig,1-18.
(16) Connect the connectors of the each detection switches to the servo circuit correctly.
(If connected wrong position, the power supply circuit and the servo circuit may become faulty.)

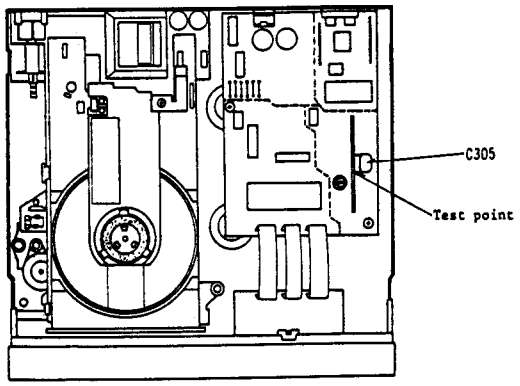
On completion of adjusting the potical pick-up set the player so that it can be power ON checked as shown Fig,1-16 and must conduct electric adjustment.

[Cautions]
a. Take care not to damage the flexible cord of optical pick-up during adjustment.
b. Before installing the servo PCB make sure that the condenser on the board is laid down.

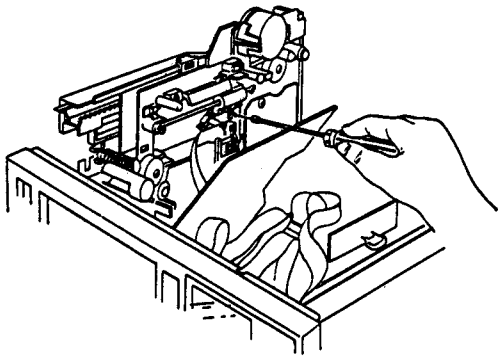
(1).Connect the oscilloscope to TJ701 (+) and TJ703 (-) of the main PCB.

Oscilloscope setting	Sweep	:0.5 μsec
	Volt	:0.5 v
	Input selector	:AC

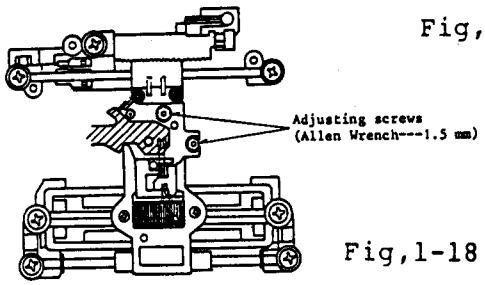
(2).Turn on the power switch and mount the uneven test disc "SZZP1056C"
(3).Play to track #3 of the test disc "SZZP1056C".
(4).Set the unit as shown Fig,1-16 with care not to give vibrations to the loading unit.
(5).Pull out the connectors CN101, CN102, CN103 of the servo PCB.
(6).Alternately turn the optical pick-up adjusting screws with hexagonal wrench "SZZP1044C" so that the eye pattern of the waveform "RF SIGNAL" of the oscilloscope is widest open as shown Fig,1-20.
(7).At the end of adjustment, playback the test disc "SZZP1014F" track No.6 and confirm the RF signal,it should be Fig,1-21.



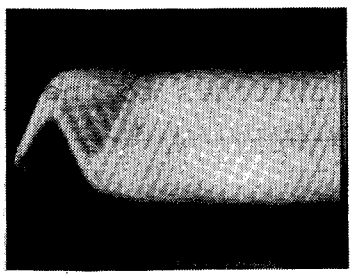
Fig,1-16



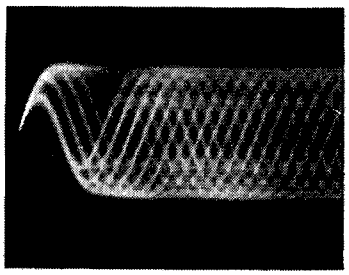
Fig,1-17



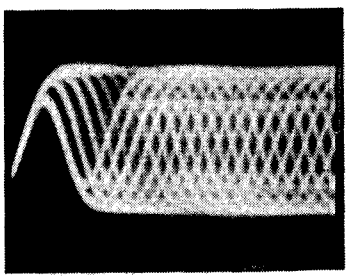
Fig,1-18



Fig,1-19



Fig,1-20



OK

Fig,1-21

※ Repeat to turn the adjusting screw in order to get best RF signal condition (Most stretched eye pattern)

※ Put the lock paint at screws after adjustment.

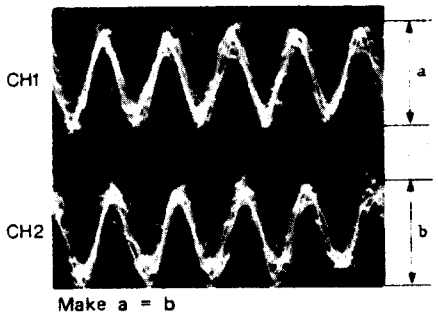
NO.9 Focus gain adjustment

(1).Adjust the low frequency oscillator to 750Hz frequency and 150mv p-p output voltage, and connect it to OSC and GND of servo gain adjuster "SZZP1017F"
(2).Connect CH-1 and CH-2 of the oscilloscope to TP-1 and TP-2 of the servo gain adjuster and TP-3 it should be grounded.

Oscilloscope setting	Sweep	: 1.0 msec
	Volt	: 100 mv
	Input selector	: DC

(3).Set the controller ON/OFF switch to ON position.
(4).Turn ON the power switch and mount the test disc "SZZP1014F" or "SZZP1054C" and play to track #1.
(5).Set the servo gain adjuster switch from 2 to 3 after playback mode.

(6).With the mode set to play and 750Hz signal appears on the oscilloscope. Then adjust VR104 so that the waveform amplitudes on both channels are equal to each other as shown Fig,1-22.



Fig,1-22

NO.10 Tracking gain adjustment

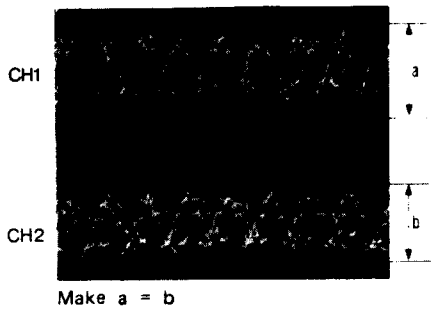
(1).Adjust the low frequency oscillator to 1.2KHz frequency and 150mv p-p output voltage, and GND of servo gain adjuster "SZZP1017F"
(2).Connect CH-1 and CH-2 of the oscilloscope to TP-1 and TP-2 of the servo gain adjuster,and TP-3 it should be grounded.

Oscilloscope setting	Sweep	: 0.5 msec
	Volt	: 100 mv
	Input selector	: DC

(3).Set the controller switch to ON position.
(4).Turn ON the power switch and mount the test disc "SZZP1014F" or "SZZP1054C" and play to track #1.
(5).Set the servo gain adjuster switch from 2 to 1 after playback mode.
(6).With the mode set to play and 1.2KHz signal appears on the oscilloscope. Then adjust VR102 so that the waveform amplitudes on both channels are equal to each other as shown Fig,1-23.
(7).The servo gain adjuster is not necessary for other adjustments, so disconnect the adjuster and insert the short connector of CN105 to the original position.

[Note]

Connect the servo gain adjuster with conversion connector "SZZP1017F" to the player as shown Fig,1-32, Fig,1-33 and Fig,1-34 by model by model.



Fig,1-23

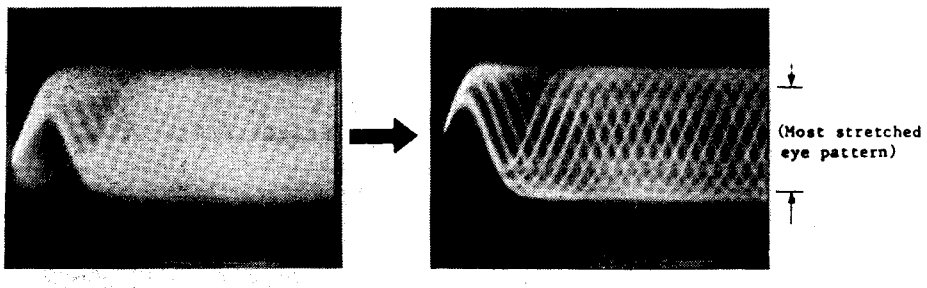
NO.11 Best eye (PD Balance) adjustment

Model. SL-PJ11,SL-P100, SL-P300, SL-P500

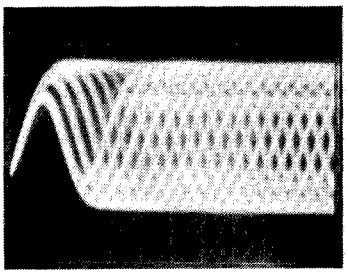
(1).Connect CH-1 of the oscilloscope to the terminal C305 on the digital module PCB and the grounding terminal of IC-11 G of the model SL-PJ11. or TJ701 (+) and TJ703 on the main PCB of the model SL-P100, SL-P300, SL-P500.

Oscilloscope setting	Sweep	: 0.5 µsec
	Volt	: 500 mv
	Input selector	: AC

(2).Turn ON the power supply switch of the player.
(3).Place the test disc "SZZP1014F" or "SZZP1054C" in to the disc holder.
(4).The player to the playback mode.
(5).Play to track #1 of the test disc "SZZP1014F" or "SZZP1054C".
(6).Adjust VR101 so that the eye pattern of RF signal is stretched most as shown Fig,1-24.
(7).Turn OFF the power supply switch of the player.



Fig,1-24



OK

Fig,1-25

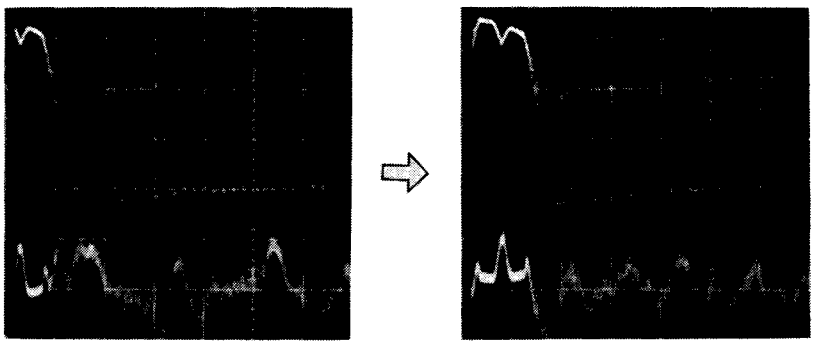
NO.12 Focus offset adjustment

Model. SL-PJ11, SL-P100, SL-P300, SL-P500

(1).Connect CH-1 of the oscilloscope to the terminal C305 on the digital module PCB and CH-2 to the terminal TJ102 on the servo circuit PCB and connect GND of the oscilloscope to the IC-11 ground point on the main PCB of the model SL-PJ11.
or connect CH-1 of the oscilloscope to TJ701 (+) and TJ703 (-) to the main PCB and connect CH-2 to the TJ102 of the servo circuit PCB of the model SL-P100, SL-P300, SL-P500.

		C305	TJ102	TJ701	TJ102
Oscilloscope setting	Sweep	:0.5msec		0.5msec	
	Volt	:500mv	100mv	500mv	100mv
	Input	:AC	DC	AC	DC
	Mode	:NORM	Triggering	CH-1	

(2).Turn ON the power supply switch of the player.
(3).Place the test disc "SZZP1057C" in to the disc holder by open/close key.
(4).The player to the playback mode.
(5).Play to track #3 of the test disc "SZZP1057C".
(6).Check the waveform of CH-1 and CH-2 on the oscilloscope and adjust VR105 so that the waveform around the triggering point shall be shown Fig,1-26



F :6

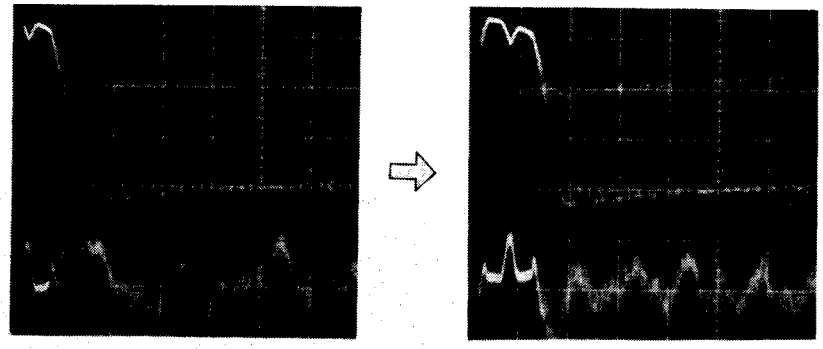
NO.13 Tracking offset adjustment

Model. SL-PJ11, SL-P100, SL-P300, SL-P500

(1).Connect CH-1 of the oscilloscope to the terminal C305 on the digital module PCB and CH-2 to the terminal TJ101 on the servo circuit PCB, and connect GND of the oscilloscope to the IC-11 ground point on the main PCB of the model SL-PJ11.
or Connect CH-1 of the oscilloscope to the TJ701 (+) and TJ703 (-) to the main PCB and connect CH-2 to TJ101 of the servo circuit PCB of the model SL-P100, SL-P300, and SL-P500.

		C305	TJ101	TJ701	TJ101
Oscilloscope setting	Sweep	:0.5msec		0.5msec	
	Volt	:500mv	100mv	500mv	100mv
	Input	:AC	DC	AC	DC
	Mode	:NORM triggering		CH-1	

(2).Turn on the power switch of the player.
(3).Place the test disc "SZZP1057C" in to the disc holder by open/close key
(4).The player to the playback mode.
(5).Play to track #3 of the test disc "SZZP1057C".
(6).Check the waveform of CH-1 and CH-2 on the oscilloscope and adjust VR103 so that the waveforms around the triggering point shall be as shown Fig.1-27.
(7).Turn off the power switch of the player.



Fig,1-27

NO.14 PLL adjustment

Model. SL-PJ11, SL-P100, SL-P300, SL-P500

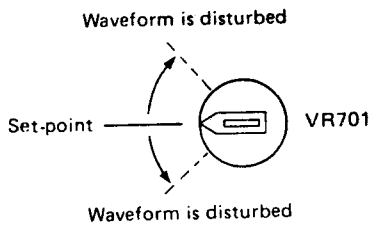
(1).Connect CH-1 of the oscilloscope to the terminal C803 or C804 of the model SL-PJ11, or to the terminal R809 of the model SL-P100, SL-P300, and SL-P500 of the main PCB and the terminal GND to the chassis.

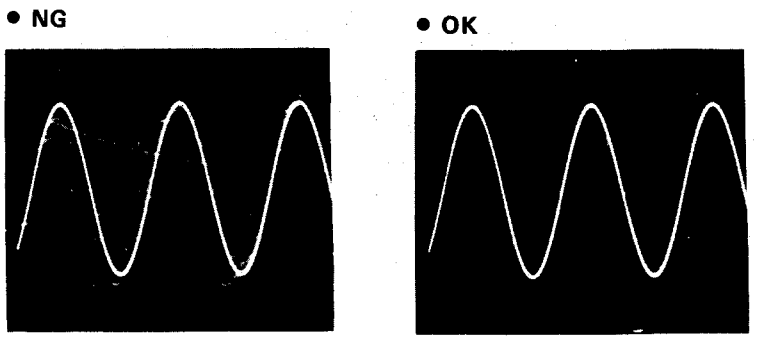
Oscilloscope setting	Sweep	: 1.0msec
	Volt	: 1.0v
	Input selector	: DC

(2).Turn ON the power supply switch of the player.
(3).Place the test disc **"SZZP1014F"** in to the disc holder by open /close key.
(4).The player to the playback mode.
(5).Play to track #6 of the test disc "SZZP1054C".
(6).Check the waveform display on the oscilloscope and adjust VR701 in the following step.

(a).Turn VR701 upwards slowly and learn the point at which the waveform on the oscilloscope begings to be disturbed as shown Fig,1-28 NG.
(b).Turn VR701 downwards slowly (opposite direction to that in the above para "a") and learn the point at which the waveform on the oscilloscope begings to be disturbed.
(c).Set the VR701 in the middle position between the points learned in the above steps "a" and "b".

Example:





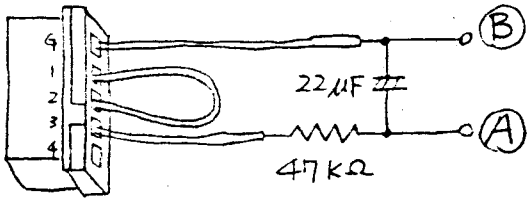
Fig,1-28

NO.15 Tracking balance adjustment

Adjust the tracking balance VR191 on tracking offset compensation PCB by following method.

Jig required

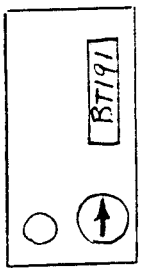
° Connector jig for tracking balance adjustment ..... SZZP1053F as shown Fig,1-29.



Fig,1-29

[Note]
This adjustment must be done after the VR101,VR102,VR103, VR104, and VR105 on optical servo PCB are adjusted.

(1).Place the traverse unit to holizontally.
(2).Initial set up for VR191 on tracking offset compensation PCB as follow as shown Fig,1-30.



Fig,1-30

(3).Unplug the CN105 and connect the connector jig for tracking balance adjustment instead of it.

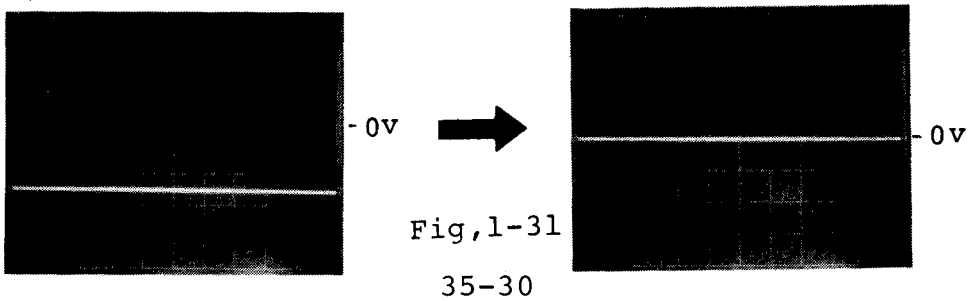
(4).Power switch to turn ON, place the test disc "SZZP1014F" or "SZZP1054C" and play to track #1.

(5).Connect the oscilloscope to "A" point and "B" point(GND) of jig as shown Fig,1-29.

Oscilloscope setting	Sweep	: 1 msec
	Volt	: 20 mv
	Input selector	: DC

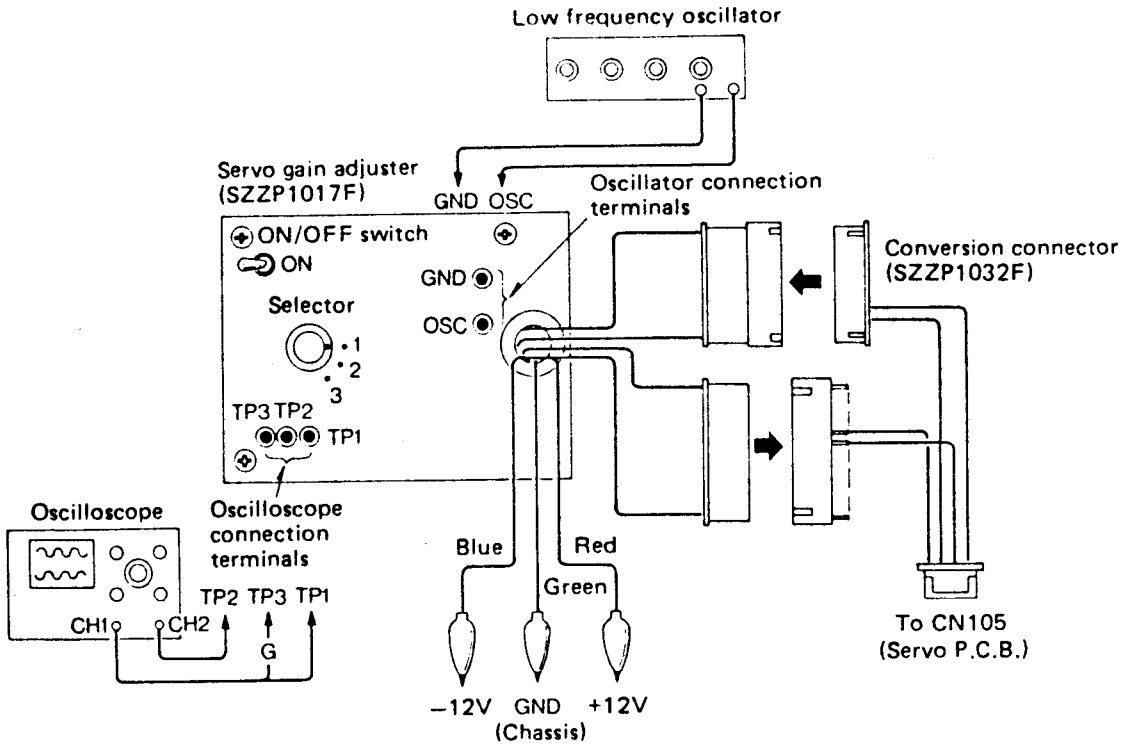
(6).Adjust DC voltage to 0 ± 5mv by VR191 as shown Fig,1-31

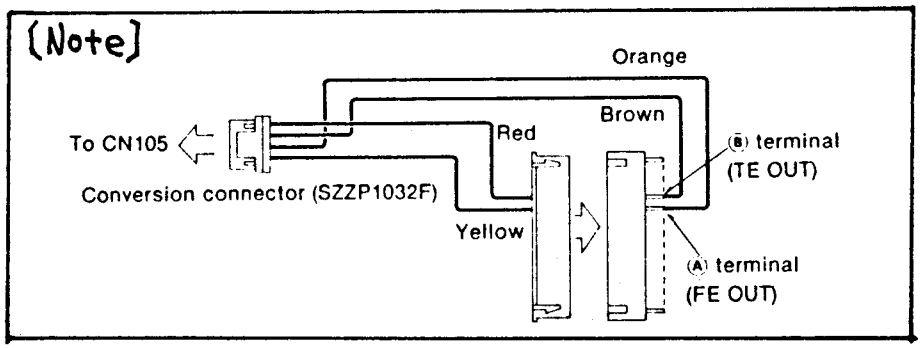
(7).Unplug the jig and reconnect the as original CN105.



Fig,1-31

NO.16 Need a following service tools

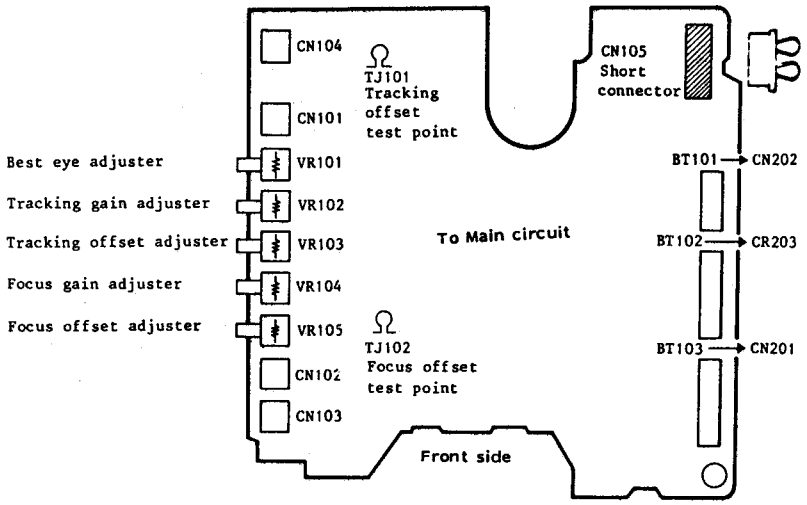




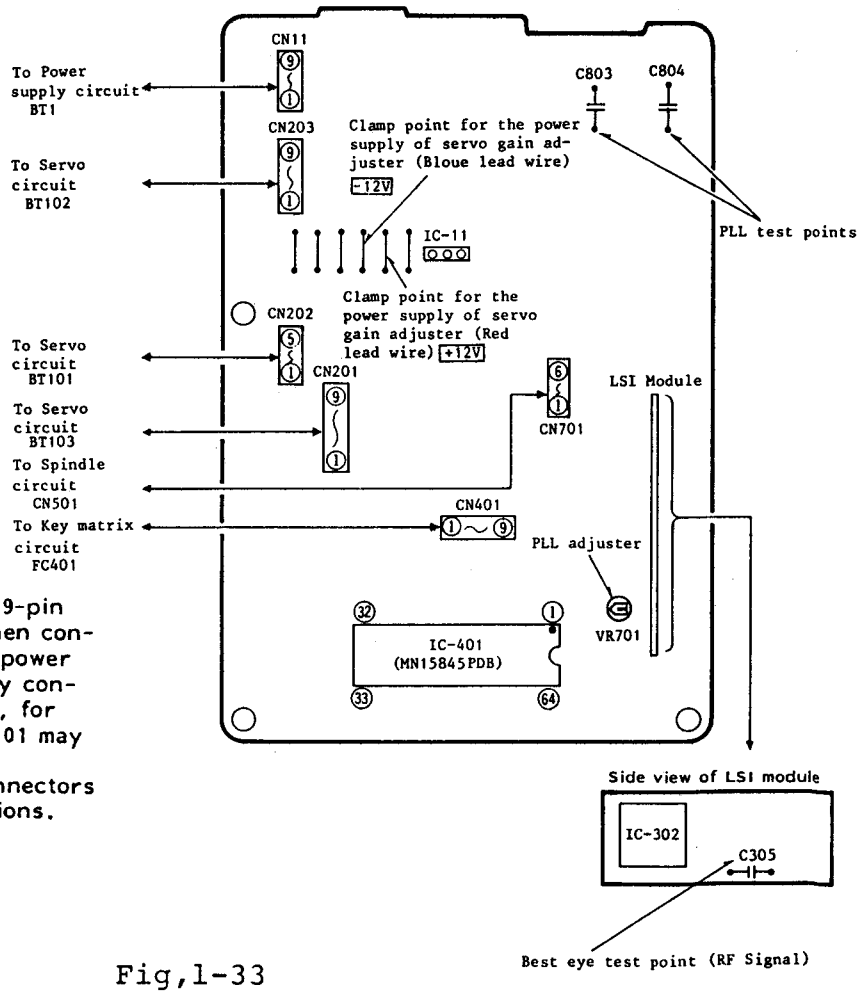
Fig,1-32

ADJUSTMENT POINTS

- Servo P.C.B.



- Main P.C.B.



NOTE:

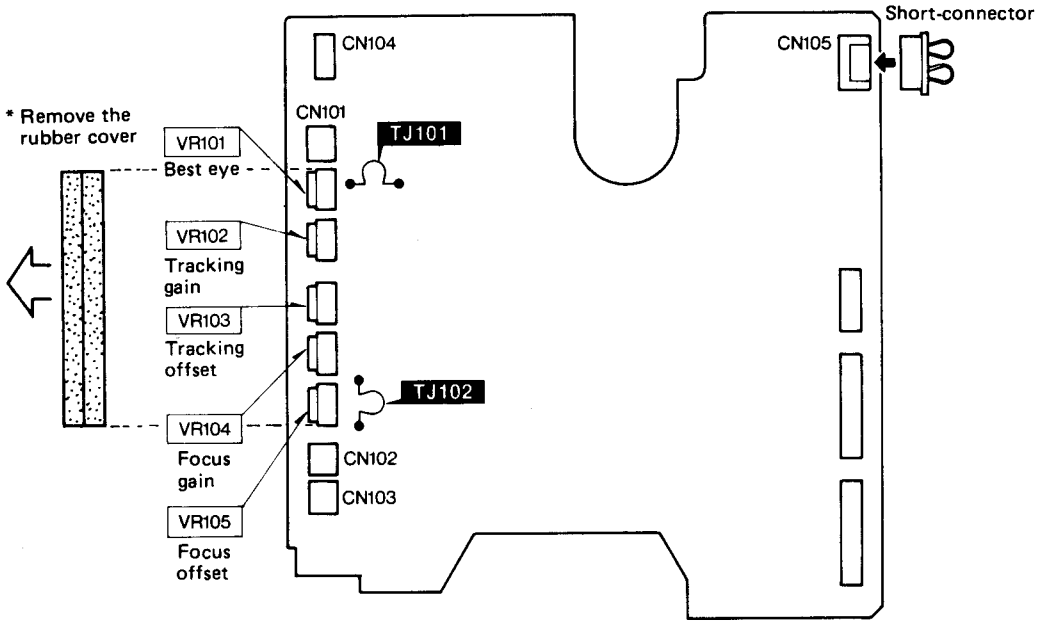
CN11, CN201, and CN203 are 9-pin connectors. Exercise care when connecting them. If the electric power supply is switched on with any connector connected wrong parts, for instance, IC13, IC14, and IC101 may be damaged.
Pater players employ color connectors for preventing wrong connections.

White connector ⟶ CN11
Pin connector ⟶ CN203
Blue connector ⟶ CN201

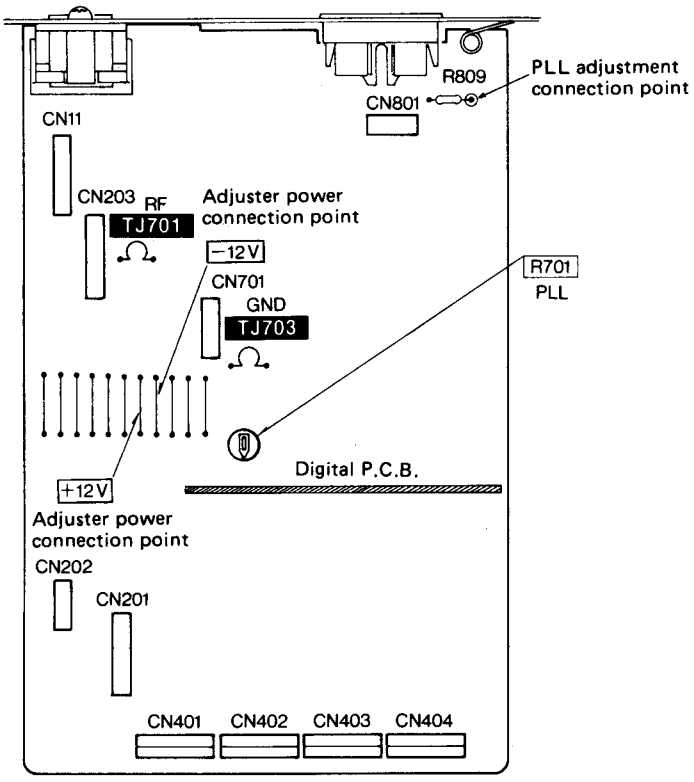
Fig,1-33

ADJUSTMENT POINTS

- **Servo P.C.B.**



- **Main P.C.B.**



Fig,1-34

NO.17 Check of play operation after adjustment

[1]. Check of skip search

(1).Play an ordinary disc.
(2).Press the skip button and check to see that skip search is given (Forward and reverse)

[2]. Check of manual search

(1).Play an ordinary disc.
(2).Press the manual search button and check to see that smooth manual search can be done at low and high speeds (Forward and reverse)

[3]. Check to make sure the best adjusted condition for defects.

(1).Play the Technics test disc "SZZP1054C'.
(2).Play the track 4 (Wedge 0.5mm), track 5 (Wedge 0.6mm), and see that there is no sound skip or noise.
(3).Play the track 9 (Black spot 0.3mm),track 10 (Black spot 0.4mm) and see that there is no sound skip or noise.

Technics Test Disc "SZZP1054C"	
Track number 4	0.5mm Wedge
Track number 5	0.6mm Wedge
Track number 9	0.3mm Black spot
Track number 10	0.4mm Black spot

Fig,1-35

NO.18 How to classfy the unit of playability improvement

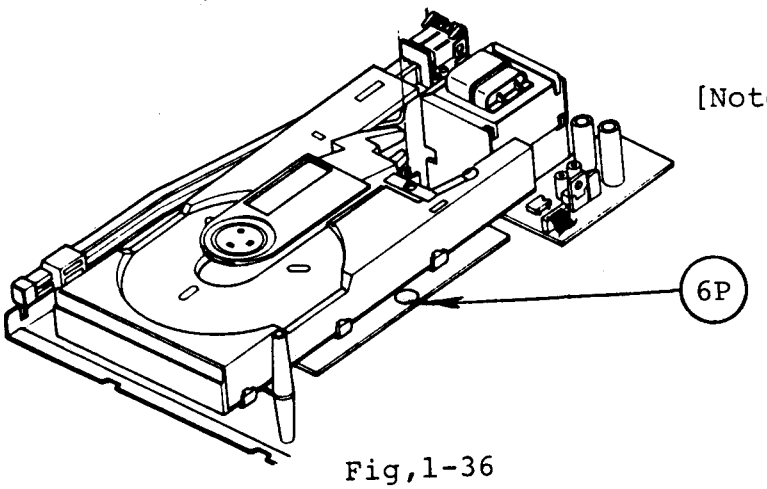
Classify the unit which is improved and not improved

[1]. Replace the optical pick-up from 4-divided type to 6-divided type.

1).Changed suffixed of serial number as below.

SL-PJ11	From	"H"	to	"J"
SL-P100		"B"	to	"C"
SL-P300		"B"	to	"C"
SL-P500		"A"	to	"B"

2).Put the 6P lavel on the optical servo PCB as shown Fig,1-36.



Fig,1-36

[Note]
Please check the 6P lavel because there are some units changed 6-divided type of optical pick-up even in the units which suffix of serial number is not changed.

[2]. Addition of the tracking offset compensation PCB.

1).Changed suffix of serial number as below.

SL-PJ11	From	"J"	to	"K"
SL-P100		"C"	to	"D"
SL-P300		"C"	to	"D"
SL-P500		"B"	to	"C"

How to read the serial number like a "AE6131D265",The suffix number is "D".

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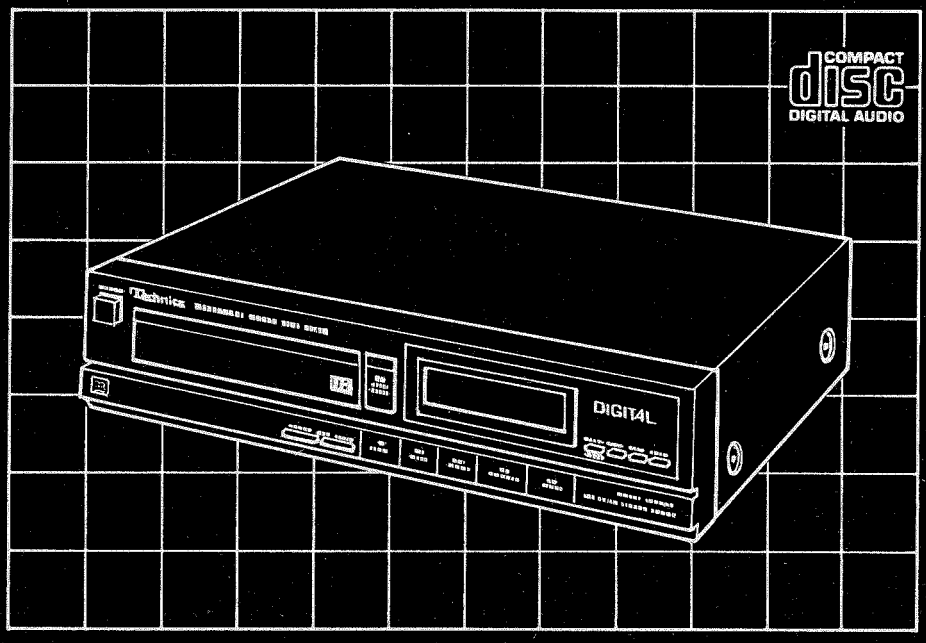
ORDER NO. HAD8509261G0
A6

Service Manual



Compact Disc Player

SL-PJ11

* Circuit Description (Traverse Mechanism)
* Electrical Adjustment Procedure
* Mechanial Adjustment Procedure
* Troubleshooting

Technics

Matsushita Electric Industrial Co., Ltd. Hi-Fi Audio Division

CORRECTION

[Apology] We made a mistake on page 15, 16, 17, 19 and 20 of SL-PJ11 service manual (Order No.HAD850926lG0) and additional notice on page 11, and 35, Please make the correction by using the below details.

1). Page 15 (6) The player to the play mode and 1.2KHz signal will be displayed on the oscilloscope, then adjust VR104 .....

It should be (VR102)

2). Page 16 (1) Oscilloscope setting ..... Sweep 0.5μsec

→ It should be (0.5msec)

3). Page 17 (1) Oscilloscope setting ..... Sweep 0.5μsec

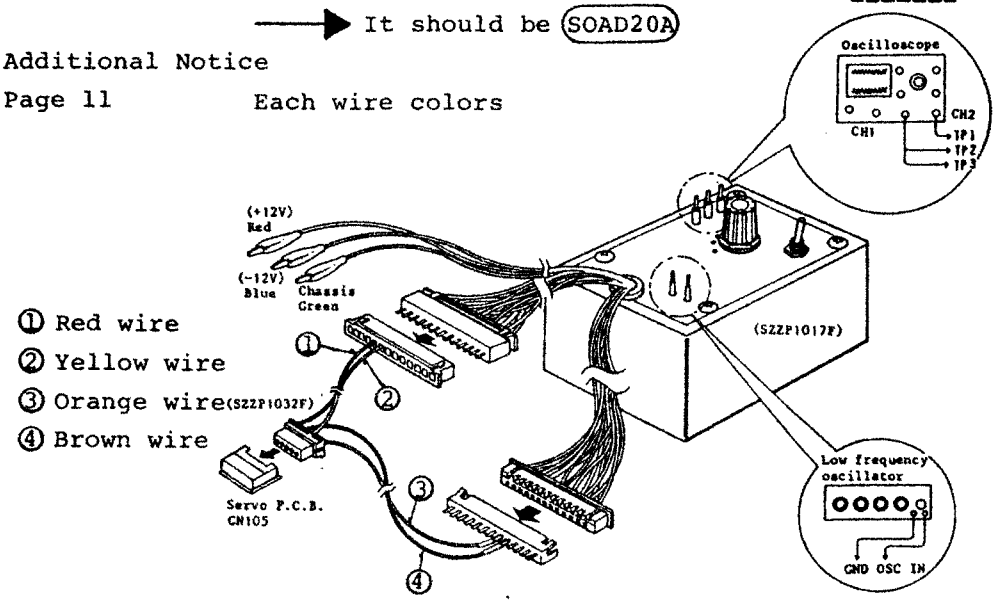
→ It should be (0.5msec)

4). Page 19,20 The replace optical pick-up parts No. SOAD10A

→ It should be (SOAD20A)

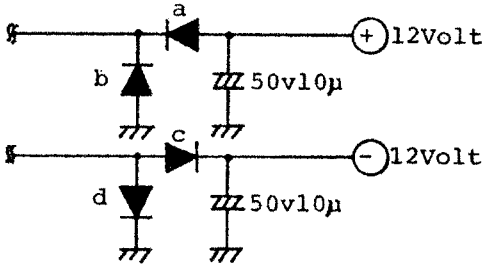
5). Additional Notice

Page 11 Each wire colors



Page 35 Protection circuit for servo gain adjuster

[Note] Please add the two of each diode (MA162) as below.



(Circuit protection)

FOREWORD

This Service manual is intended to be used for seminars and selfstudies in combination with the technical guide of SL–XP7. Therefore, teose common to SL–PJ11 are omitted:

Accordingly, main differences from SL–XP7 are involved.

1. *Behavior of system*
2. *Traverse mechanism*
3. *Traverse Servo circuit*

These circuits are described in 3 chapters, and other related circuits are omitted. So, refer to the technical guide of SL–XP7 circuit.

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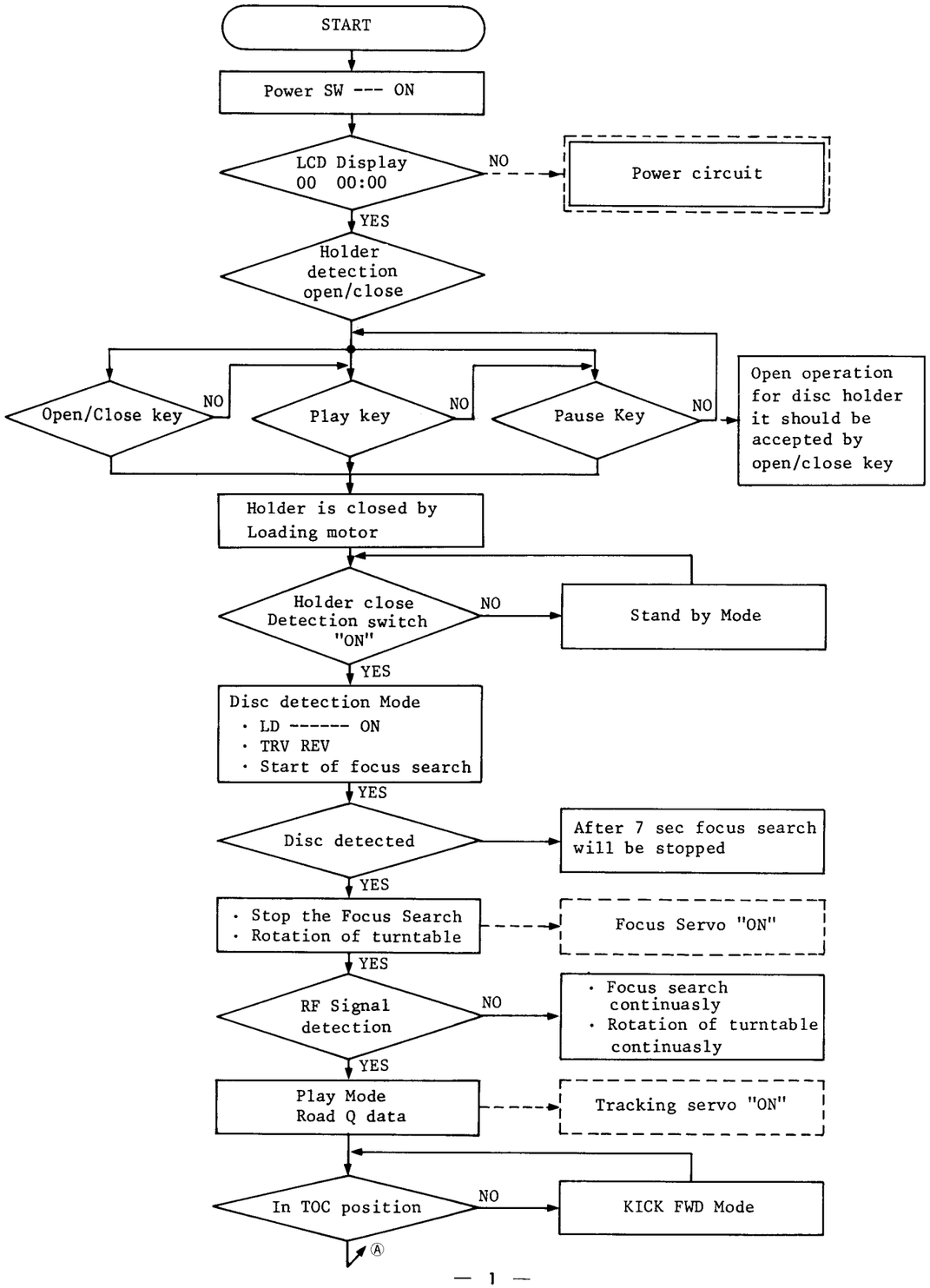
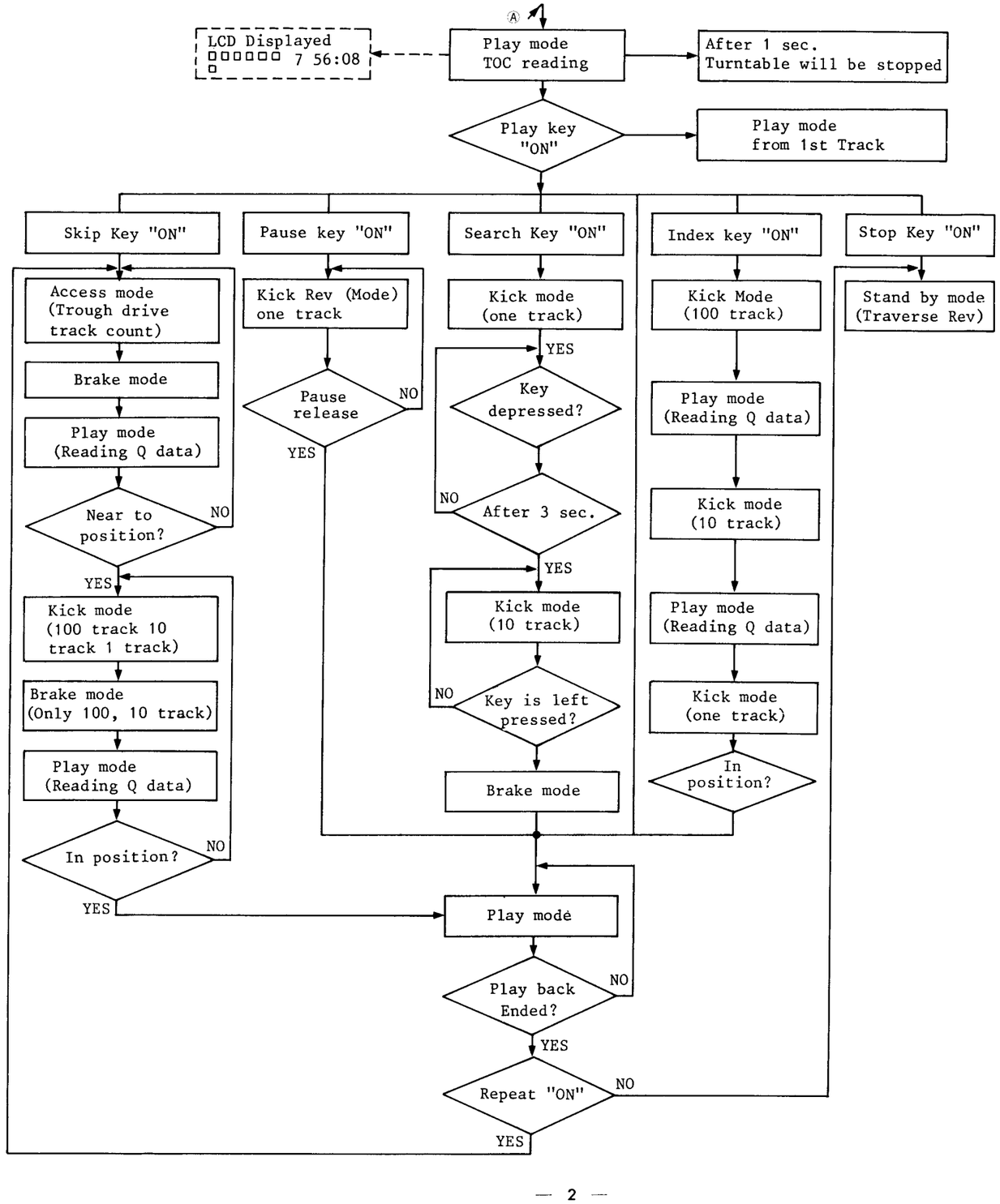
1. BEHAVIOR OF SYSTEM





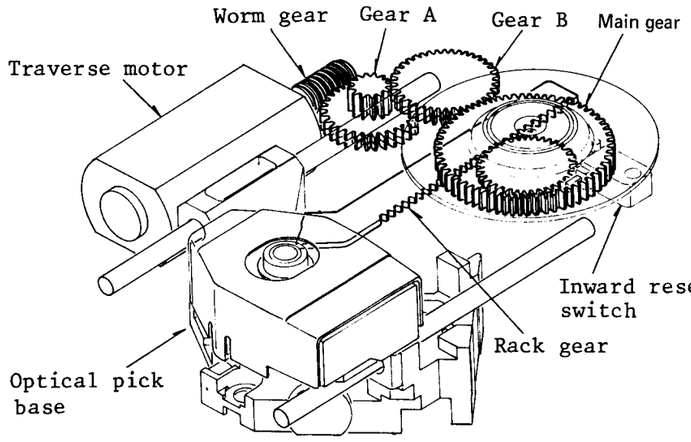
2. TRAVERSE MECHANISM

2-1. DC Motor Drive Method and Linear Motor Drive Method

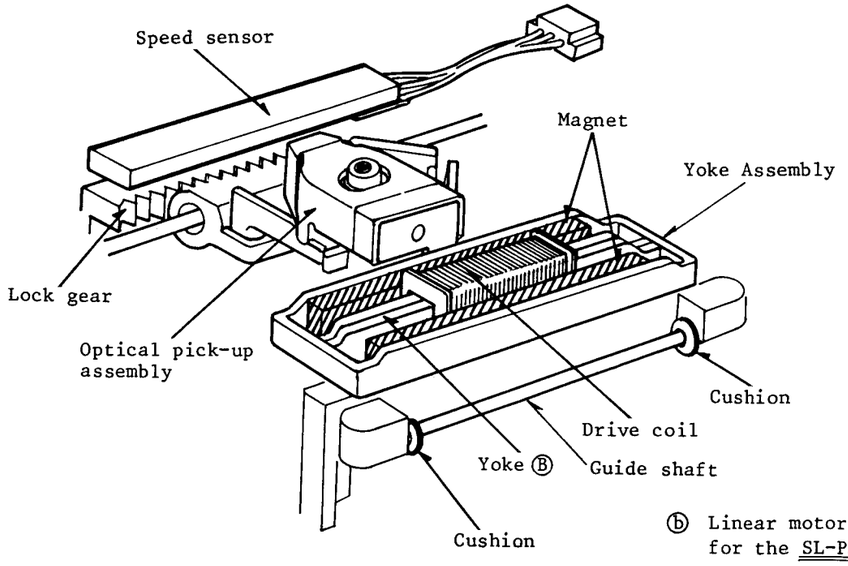
The traverse mechanism of SL-PJ11 drives the optical pick-up unit in the linear motor drive method unlike the conventional DC motor drive method. The new and previous traverse mechanisms are shown in Fig. 2-1.

The biggest difference between the two methods is that the DC motor drive method converts rotational motion to linear motion by gears etc. and the linear motor drive method produces linear motion directly by the electromagnetic induction effect not requiring conversion.

As a result, looseness and friction likely to occur with gears are minimized enabling high speed access (the speed is increased about four times). Further, the employment of a speed sensor has attained the stable and precise optional pick-up drive mechanism.



ⓐ DC motor method for the SL-XP7



ⓑ Linear motor method for the SL-PJ11.

Fig.2-1 Traverse Mechanism

2-2. Traverse Mechanism and Detection of Optical Pick-Up

The traverse mechanism drives the optical pick-up by the linear motor as shown in Fig. 2-1 ⓑ.

By applying a signal current to the drive coil, the drive coil moves sliding on the yoke Ⓑ according to electromagnetic induction (left hand rule of Fleming) caused by the magnet of the yoke Ⓐ assembly and the yoke Ⓑ. Thus the optical pick-up integrating the drive coil travels by sliding the built in brush on a linear resistor unit (speed sensor).

SL-PJ11 is not provided with any position detection switch such as the inward-most and end position detection switches of the conventional models (SL-XP7 is not provided with the end position detection switch). The optical pick-up unit is mechanically pressed against the cushion rubber located at the limit end position of the guide shaft.

The microcomputer continues to output the reverse command for about one second for pressing the optical pick-up against the cushion when the pick-up is returned to the inward-most position.

2-3. Operational Principle of Linear Motor Tracking Method

The operational principle of the linear motor is that thrust (F) is produced when current (I) is applied to a coil placed in a space of flux density (B). The linear motor employed by the traverse servo system uses the thrust (F) for driving the optical pick-up between inward and outward positions.

N pole are arranged on the both sides of the coil through which current (I) is flowing as shown in Fig. 2-2. Magnetic flux (B) works in the opposite direction via the iron core (S pole) in the coil, i.e., vertically to the cross section illustrated in the text. Thrust (F) works in the direction of ⊗ (cross), and in the direction of ⊙ (dot) when the flow of current (I) is reversed.

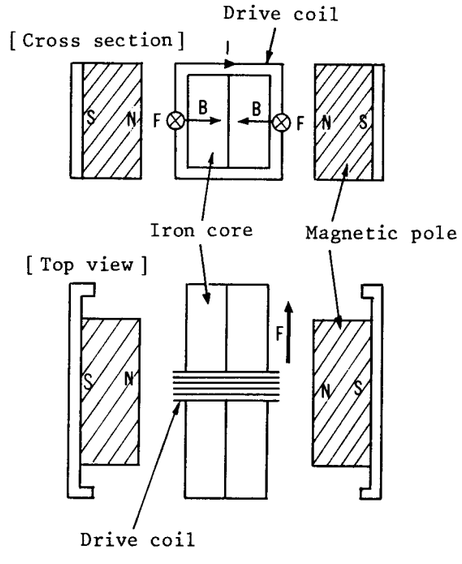


Fig.2-2

3. BEHAVIOR OF TRAVERSE CIRCUITRY

The traverse circuitry is shown in Fig. 3-1. It comprises a tracking traverse circuit, a forced traverse circuit, and a speed detector.

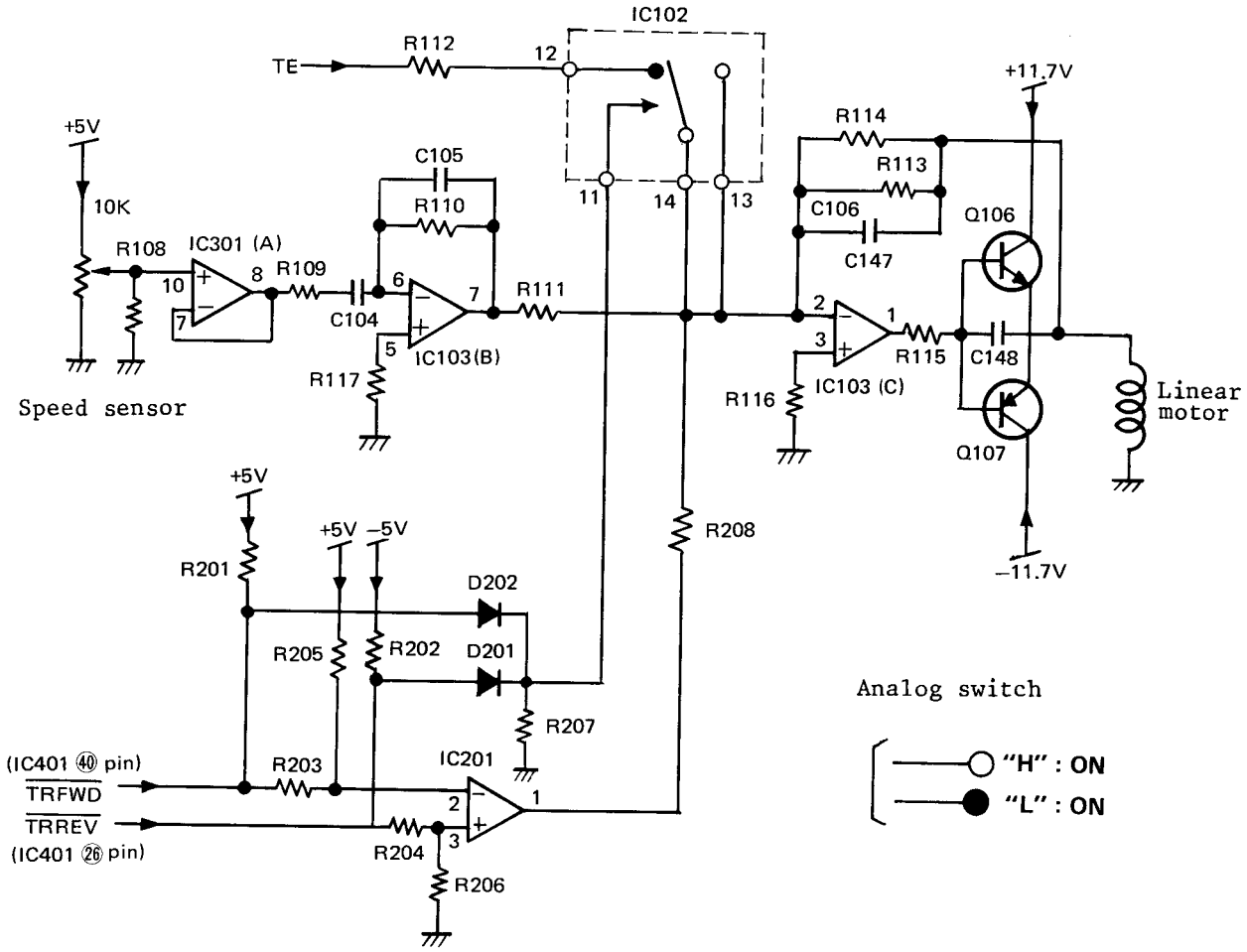


Fig. 3-1 Traverse Servo Circuit

3-1. Tracking Traverse

The tracking error signal in one turn of the disc is an eccentricity component signal of the disc and the overall tracking error signals in several turns of the disc form a DC voltage (the error voltage of the servo system) shown in Fig. 3-2. The DC voltage in the forward mode is opposite to that in the reverse mode centering about 0V.

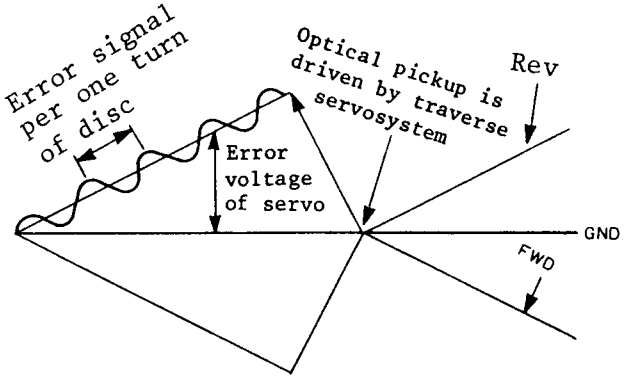


Fig. 3-2 Traverse Servo Voltage

The voltage at the pin ⑪ of the analog switch IC102 is a low level in the play mode and manual search modes. Accordingly the tracking error signal (TE) is directed to the motor driver consisting of IC-103 (C), Q106, and Q107.

High frequency component of the tracking error signal is removed by C147. The DC component of the signal is extracted by IC103 (C) and its external capacitors and resistors and applied to the drive coil of the linear motor to drive the optical pick-up from inside to outside.

The optical pick-up is driven from inside to outside when the drive current is negative and from outside to inside when the drive current is positive.

3-2. Forced Traverse

The optical-pick up is traversed in the skip mode by forcibly applying voltage to the drive coil of the linear motor.

In the skip mode, $\overline{\text{TRFWD}}$ and $\overline{\text{TRREV}}$ signals are applied from the system control (IC401) to IC201. The system control (IC401) outputs low level pulses from the pin ㊴ and ㊵ to turn the voltage at the pin ⑪ of the analog switch IC-102 to a high level. Whereby the pins ⑬ and ⑭ are turned on and the pin ⑫ is turned off. Thus the tracking error signal is not applied to the drive coil.

In the skip forward mode, a low level pulse is applied to the negative input terminal, pin ②, of IC201 and the pin ① outputs a positive voltage signal because the positive signal is larger than the negative signal. The positive voltage signal is applied to the drive coil and the optical pick up (the drive coil) travels from inside to outside.

In the skip reverse mode contrarily, a low level pulse is applied to the positive input terminal, pin ③, of IC201, and the pin ① outputs a negative voltage signal because the negative voltage is larger than the positive voltage. The negative DC voltage is applied to the drive coil and the optical pick-up travels in the opposite direction to that in the skip forward mode.

Even in the skip mode, the position is detected by the potentiometer and fed back as in the play mode, for making traverse servo operation smoothly.

3-3. Speed Detector

When voltage is applied to the drive coil of the linear motor forcedly in manual search and high speed search, an induction voltage corresponding to the displacement is detected by the speed sensor. The induced voltage is directed to the differentiating circuit, IC-103 (B), via the buffer amplifier, IC-103 (A). The speed is detected by IC-103 (B) and fed back to the motor driver consisting of IC-103 (C), Q106, and Q107, for stabilizing the traverse of the optical pick-up.

4. ADJUSTMENT PROCEDURE

Refer to the service manual for the disassembling methods of each parts.

(Note) Avoid the direct entrance of laser rays into the eyes and exposure of the body to laser rays which are dangerous. Especially be carefull in the electric and optical pick-up adjustments because a laser beam is radiated from the lens of the optical pick-up when the power supply of SL-PJ11 is turned on. Also follow the adjusting procedures given in the manual.

4-1. Preparation for Electric Adjustments

① Remove the cabinet.

② Remove the power switch rod.

③ Release the optical pick-up lock by pressing in the lock shaft located on the underside of SL-PJ11 (▮ (Lock) → ▬ (Free)).

(Note 1)

The pick-up detects signals recorded on the disc with a laser beam. The pick-up moves as the programs are played back but the movement is not visible from outside.

Caution:

- Must remove a disc from the player and lock the pick-up by pressing in the lock shaft when the player is transported as in moving.
  Otherwise, the disc loading mechanism is moved and damaged.
- Also lock the pick-up by pressing in the lock shaft in (▬→▮) prior to disassembling the player.

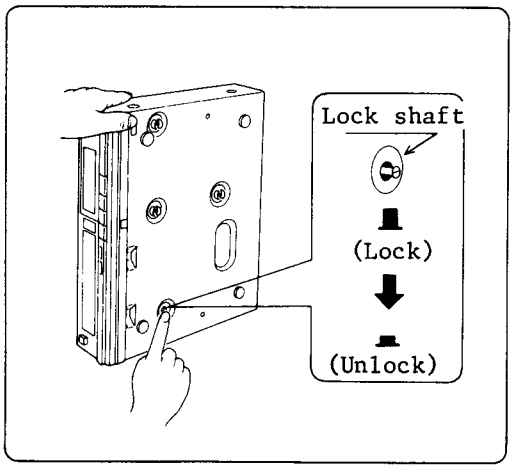
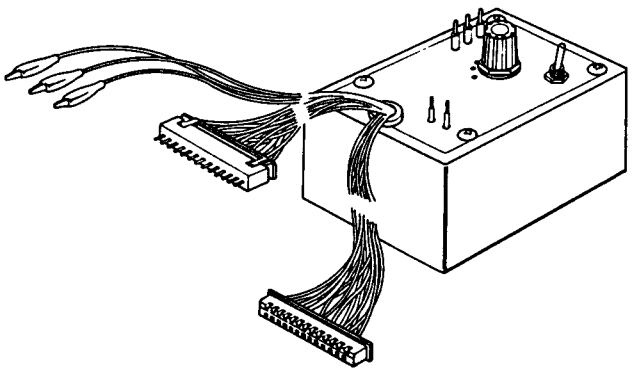


Fig. 4-1 Lock Shaft

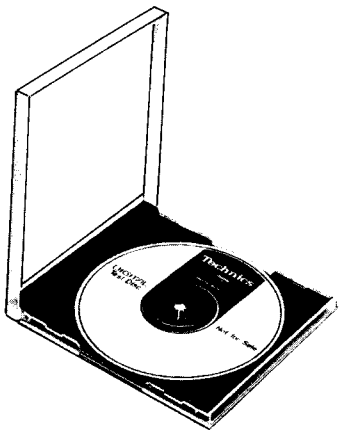
4-2. Measuring Instruments and Special Tools

Must provide special tools prior to starting electric adjustment and optical pick-up adjustment. The special tools are available through the ordinary part supply route. Specify the part numbers (SZZP ----) when placing your order.

1. Servo gain adjuster
   (SZZP1017F)

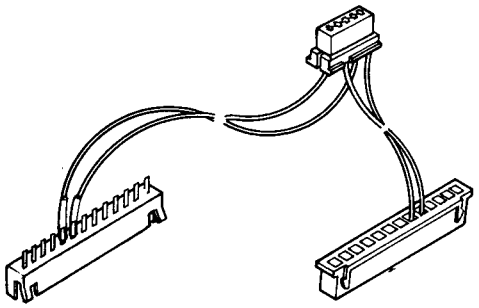


2. Test disc
   (SZZP1014F)



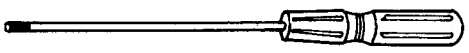
3. Short lead with clip
4. Ordinary disc
5. 2-channel oscilloscope
   (with external trigger more than 30MHz)
6. Low frequency oscillator
7. Adjusting screwdriver ----- SZZP1043C
9. Allen wrench ---------- SZZP1044C
10. General servicing tools

8. Conversion connector
   (SZZP1032F)



7. Adjusting screwdirver
   (SZZP1043C)

9. Allen wrench
   (SZZP1044C)



4-3. Adjusting Point and Test Point Illustration

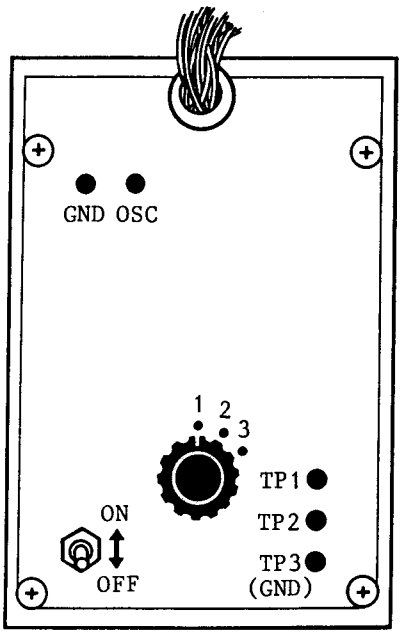


Fig. 4-3 Servo Gain Adjuster

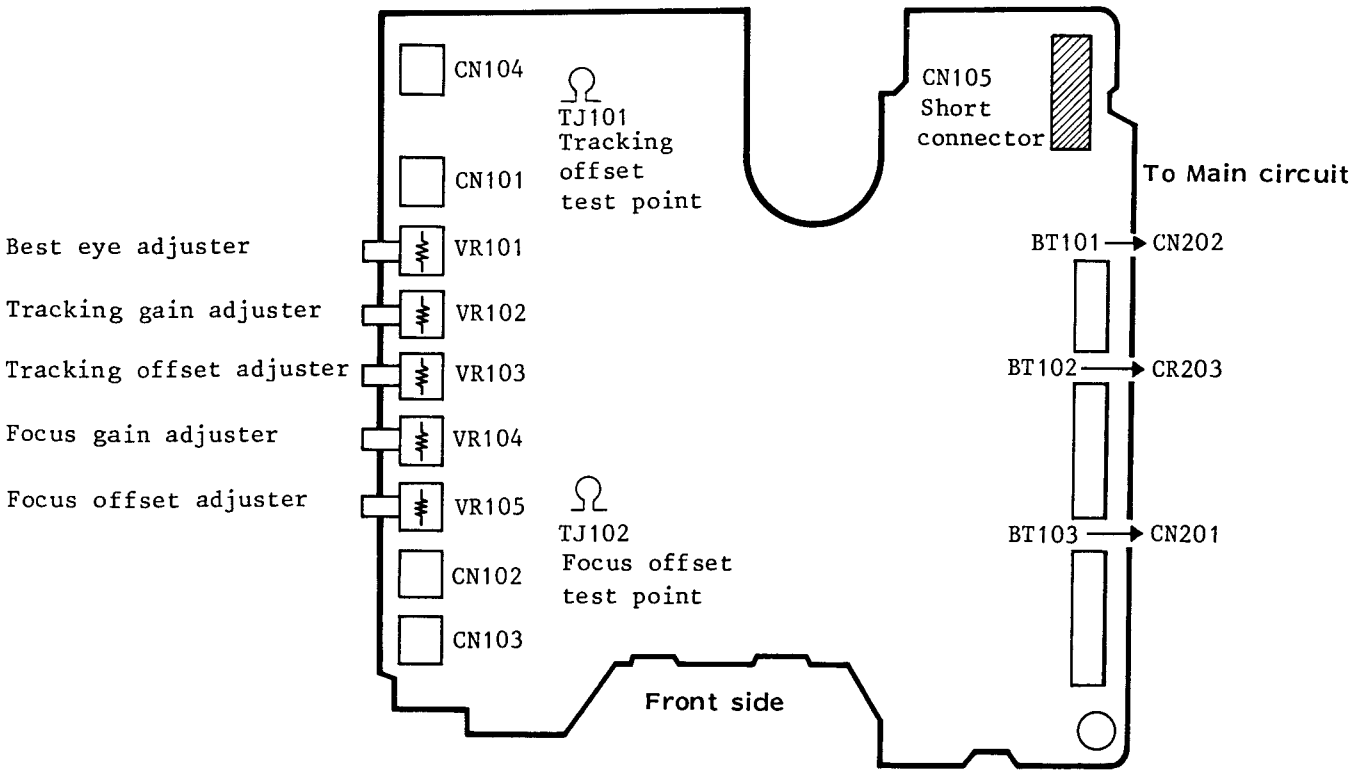


Fig. 4-4 Optical Servo Circuit

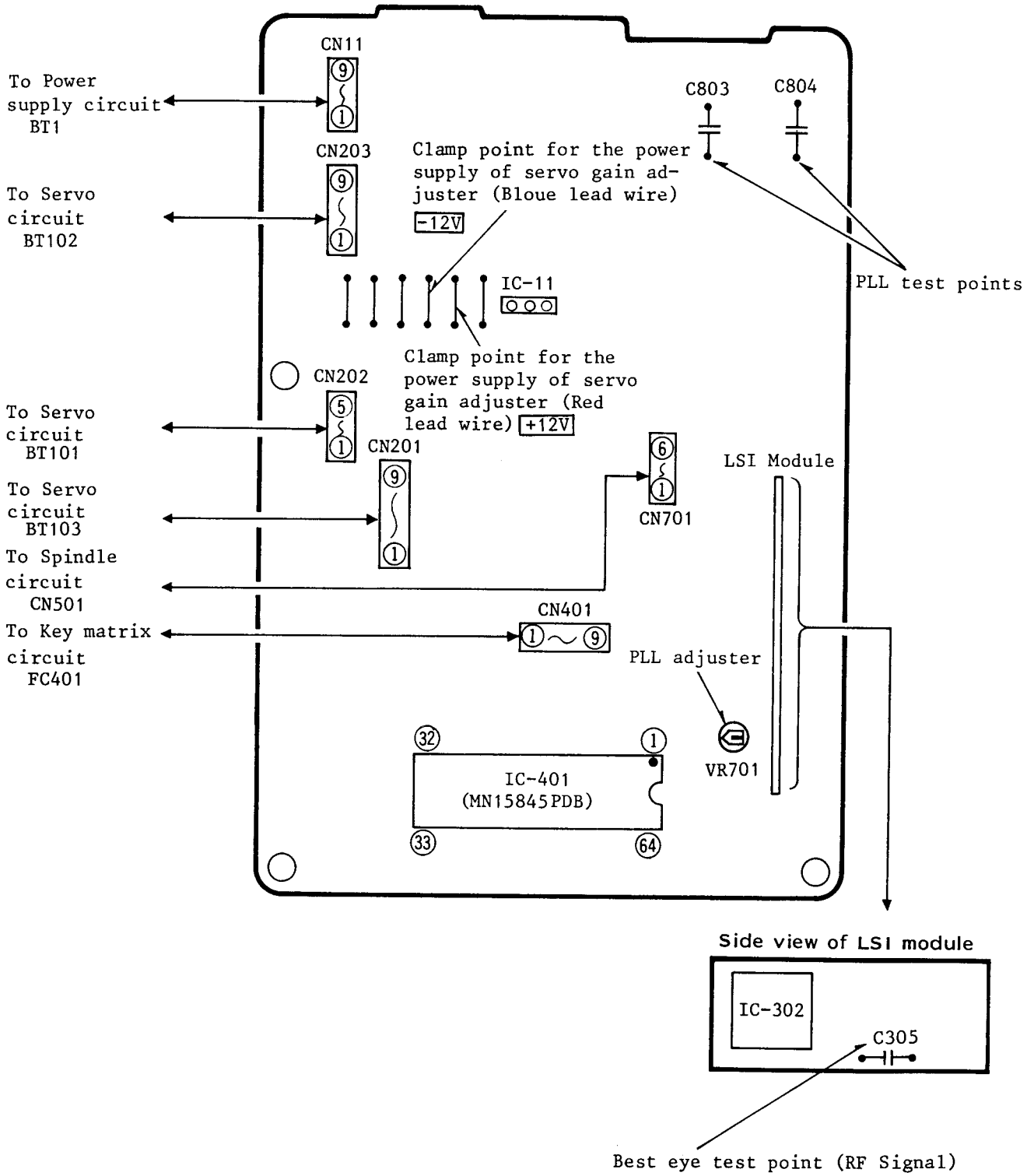
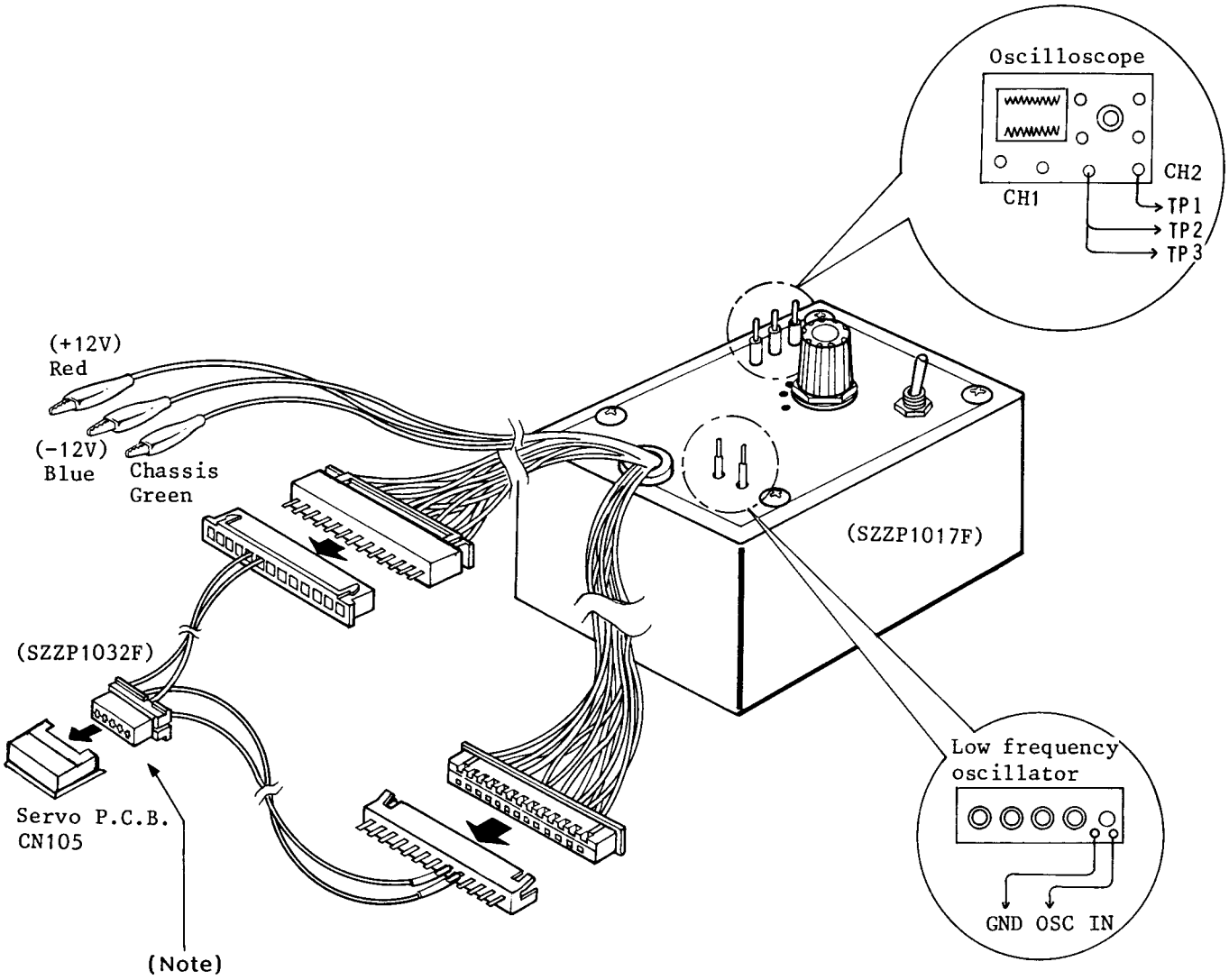


Fig. 4-5 Main Circuit

(Note) CN11, CN201, and CN203 are 9-pin connectors. Exercise care when connecting them. If the electric power supply is switched on with any connector connected wrong parts, for instance, IC13, IC14, and IC101 may be damaged.
Pater players employ color connectors for preventing wrong connections.

White connector → CN11
Pin connector → CN203
Blue connector → CN201

4-4. Servo gain adjuster and its connection



(Note)

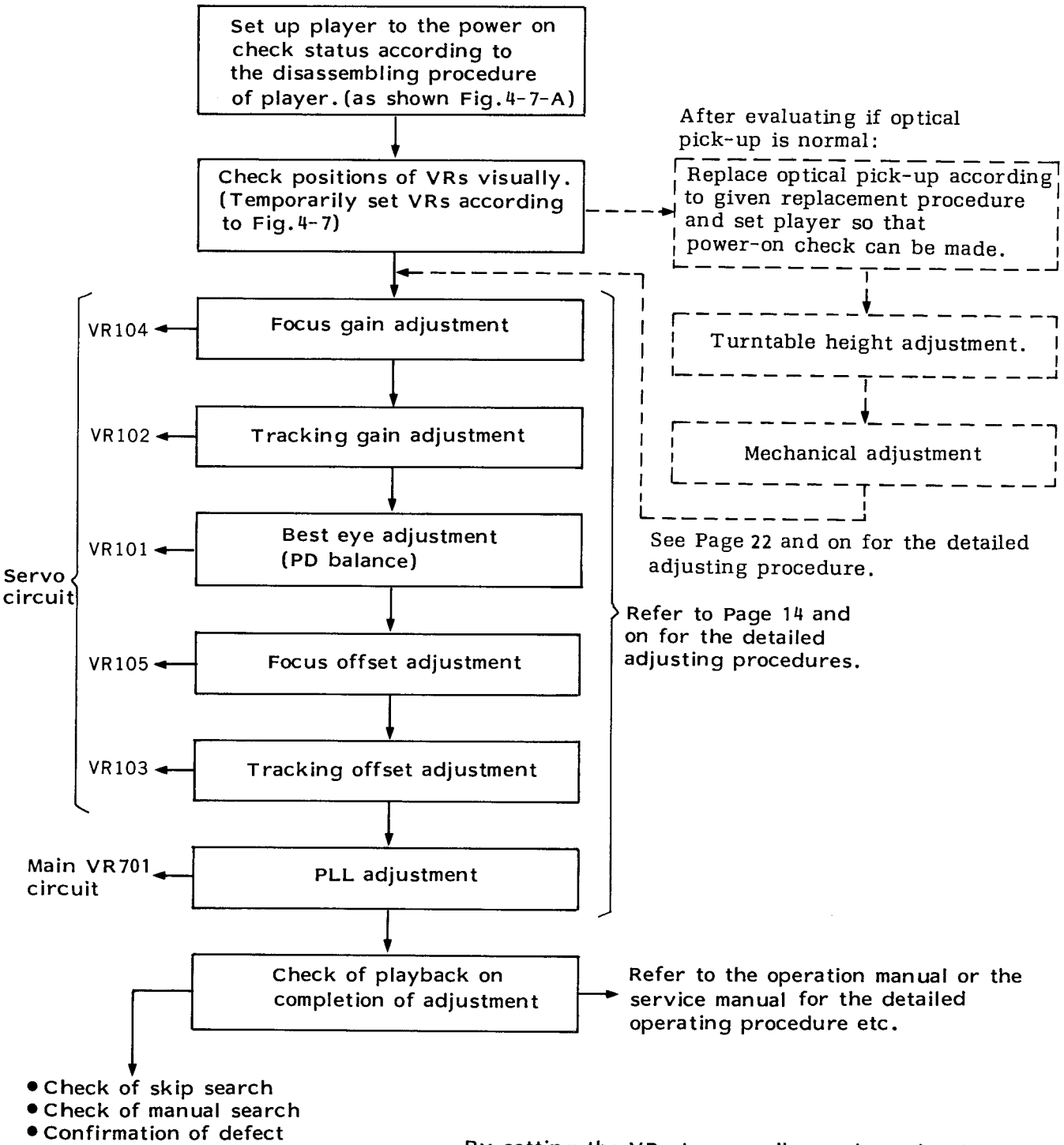
CN105 of the servo PCB is provided with a short circuiting connector.
Remove the CN105 connector and install the conversion connector (SZZP1032F) for adjustment.
On completion of adjustment, must return the short-circuiting connector to its place.

Fig. 4-6 Servo Gain Adjuster

Caution:

(1) Do not look into the lens when power is applied to the unit, since there is laser radiation (H.H.S./D.H.W./etc., regulation).
(2) These steps must be followed in order.

4-5. Electric Adjustment Steps and Points


Set up player to the power on check status according to the disassembling procedure of player. (as shown Fig.4-7-A)
Check positions of VRs visually. (Temporarily set VRs according to Fig.4-7)
After evaluating if optical pick-up is normal:
Replace optical pick-up according to given replacement procedure and set player so that power-on check can be made.
Turntable height adjustment.
Mechanical adjustment
See Page 22 and on for the detailed adjusting procedure.
Servo circuit
VR104
Focus gain adjustment
VR102
Tracking gain adjustment
VR101
Best eye adjustment (PD balance)
VR105
Focus offset adjustment
VR103
Tracking offset adjustment
Main VR701 circuit
PLL adjustment
Refer to Page 14 and on for the detailed adjusting procedures.
Check of playback on completion of adjustment
Refer to the operation manual or the service manual for the detailed operating procedure etc.
• Check of skip search
• Check of manual search
• Confirmation of defect

By setting the VRs temporarily as shown in Fig. 4-7, the player run somehow that the optical pick-up is satisfactory but VRs must be adjusted optimumly finally.

4-6. Initial Setting Points of Adjusting Variable Resistors (VR)

- Adjusting Variable Resistors and Test Points

The player operates but not optimum at the above settings of the adjusting variable resistors. Adjust them according to the adjusting procedure.

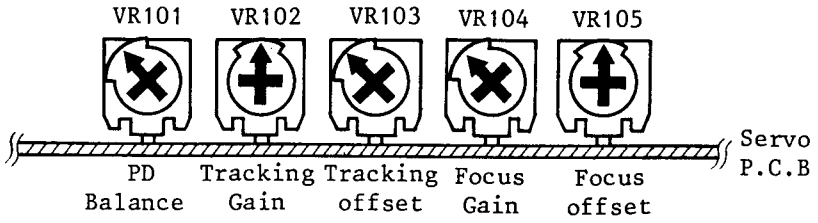


Fig. 4-7 Temporarily Set VRS

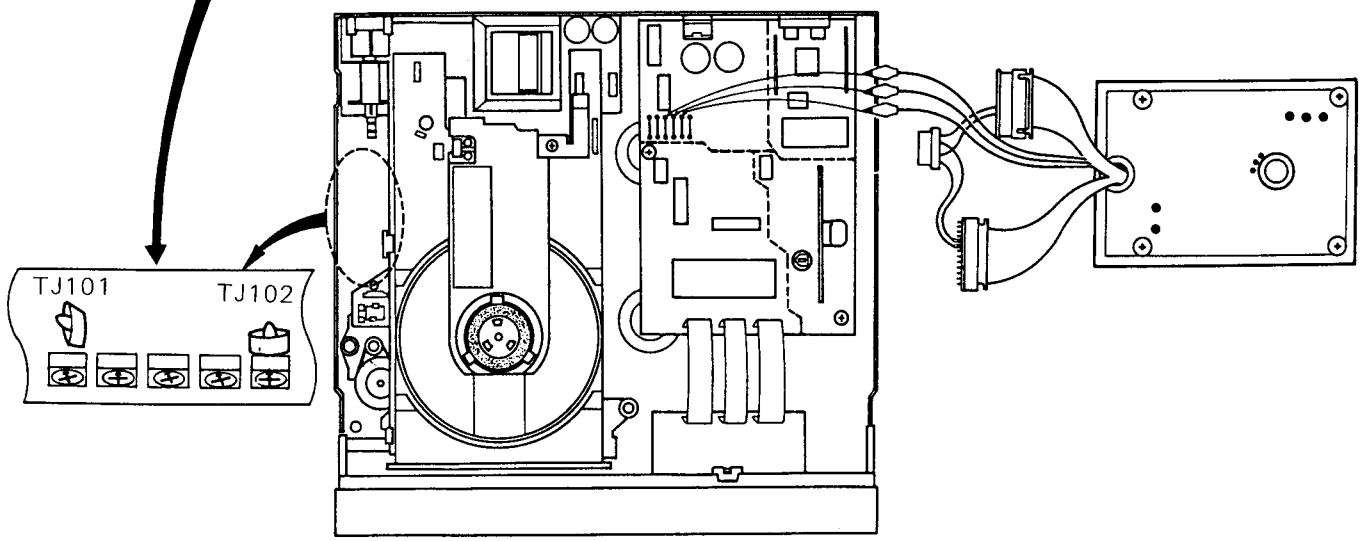


Fig. 4-7-A Power on check status

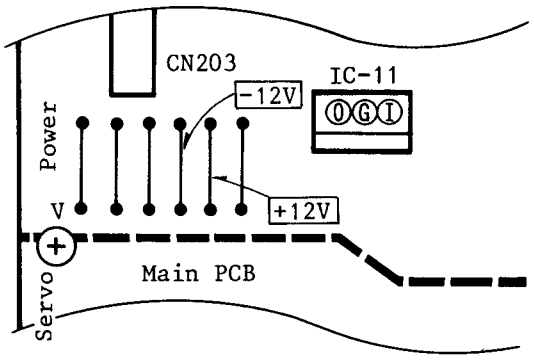
Must conduct the electric adjustment when any electric part is replaced. Perform ① optical pick-up adjustment and ②electric adjustment in the stated order when the optical pick-up (SOAD 20A) is replaced.

Arrangement of the adjusting variable resistors viewing the side face. All the electric adjustments are possible by setting as shown in Fig. .
(Removed the power supply switch rod for the convenience of adjustment.)

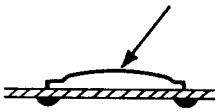
A. Focus Gain Adjustment

(1) Connect the servo gain adjuster with conversion connector (SZZP1017F) to the player as shown in Fig. 4-6.

Connecting points:
- Red lead: Jumper (+12 V) beside the IC11 terminals on the main PCB
- Blue lead: Jumper (-12 V) beside the IC11 terminals on the main PCB
- Green lead: Chassis
- Connector: Remove the short-circuiting pin of CN105 on the servo PCB and connect the conversion connector (SZZP1032F). Connect the conversion connector side (5 pins) to CN105.



Bend the jumper with a plier or the like as illustrated below so that the jumper can be clipped.



(2) Set the low frequency oscillator to a frequency 750 Hz and an output voltage of 150 mV_{p-p} then connect the oscillator to the terminals OSC IN and GND of the servo gain adjuster (SZZP1017F).

(3) Connect CH-1 and CH-2 of the oscilloscope to TP1 and TP2 of the Servo gain adjuster (SZZP1017F). (TP3 is the grounding terminal.)

Oscilloscope setting:
- Volt ..... 100 mV
- Sweep ..... 1 ms
- Input selector ..... DC

(4) Turn on the power supply switch of the player.

(5) Place the test disc (SZZP1014F) in to the disc holder by open/close key and in the Playback mode.

(6) Set the rotary switch of the servo gain adjuster (SZZP1017F) to "2"→"3" and the on/off switch to "ON" position.

(7) The player to the Play mode and the 750 Hz signal will be displayed on the oscilloscope, then adjust VR104 so that the waveforms and amplitudes of the both channels shall be equal as shown Fig. 4-8.

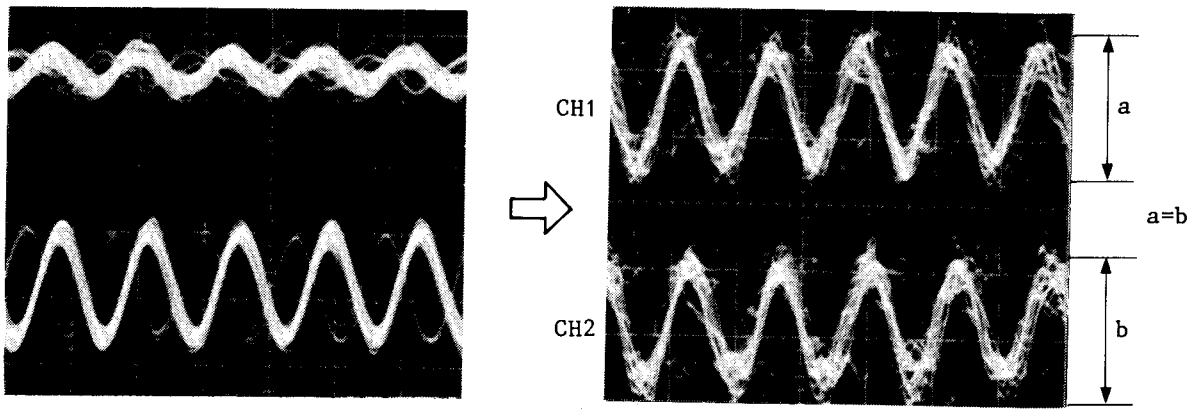


Fig. 4-8 Focus gain

a = b

(8) Turn off the power supply switch of the player.

B. Tracking Gain Adjustment

(1) Set the low frequency oscillator to a frequency of 1.2 kHz and an output of 150 mVp-p, and connect the oscillator to the OSC IN and GND of the gain adjuster (SZZP1017F).

(2) Connect the CH-1 and CH-2 of the oscilloscope to the TP1 and TP2 of the gain adjuster (SZZP1017F). (TP3 is a grounding terminal.)

Oscilloscope setting
- Volt : 100 mV
- Sweep : 0.5 ms
- Input selector : DC

(3) Turn on the power supply switch of the Player.

(4) Place the test disc (SZZP1014F) in to the disc holder by open/close key and in the Playback mode.

(5) Set the rotary switch of the servo gain adjuster (SZZP1017F) to "2"→"1" and the on/off switch to "ON" position.

(6) The player to the play mode and the 1.2 kHz signal will be displayed on the oscilloscope, then adjust VR104 so that the waveforms and amplitudes of the both channels shall be equal as shown Fig. 4-9.

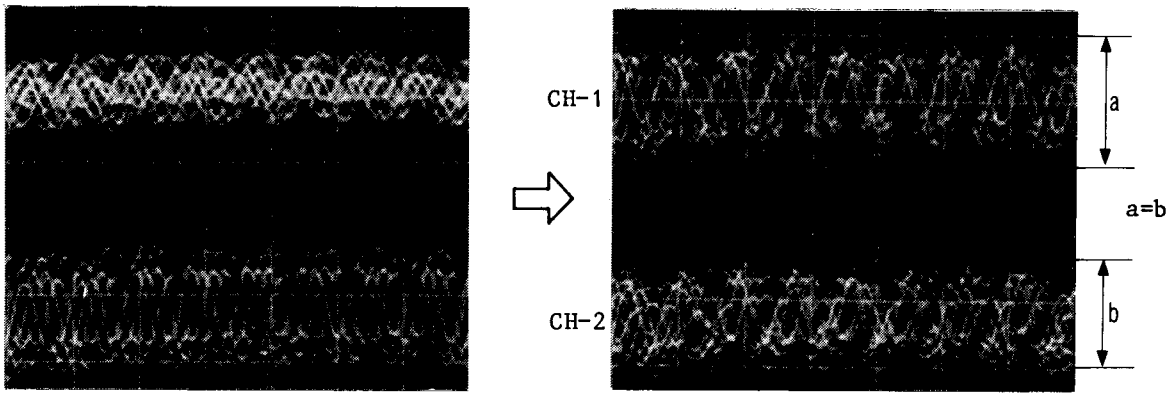


Fig. 4-9 Tracking gain

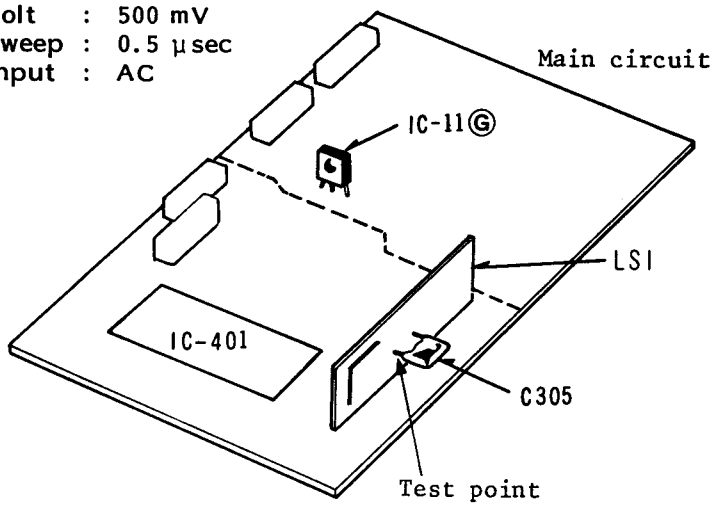
(7) Turn off the power supply switch of the player.

(8) After completing the above mentioned adjustment, remove the servo gain adjuster and insert the shorting connector into CN105 as it was.

C. Best Eye (PD Balance) Adjustment

(1) Connect CH-1 of the oscilloscope to the terminal C305 (either right or left legs) on the LSI module PCB and the grounding terminal of IC-11 Ⓖ.

Oscilloscope setting
- Volt : 500 mV
- Sweep : 0.5 μsec
- Input : AC



(2) Turn on the power supply switch of the player.

(3) Place the test disc (SZZP1014F) in to the disc holder by open/close key.

(4) The player to the play mode.

(5) Play TR8 or 13 (BS 0.5 mm) of the test disc (SZZP1014F).

(6) Adjust VR101 so that the eye pattern of RF signal is stretched most as shown in Fig. 4–10.

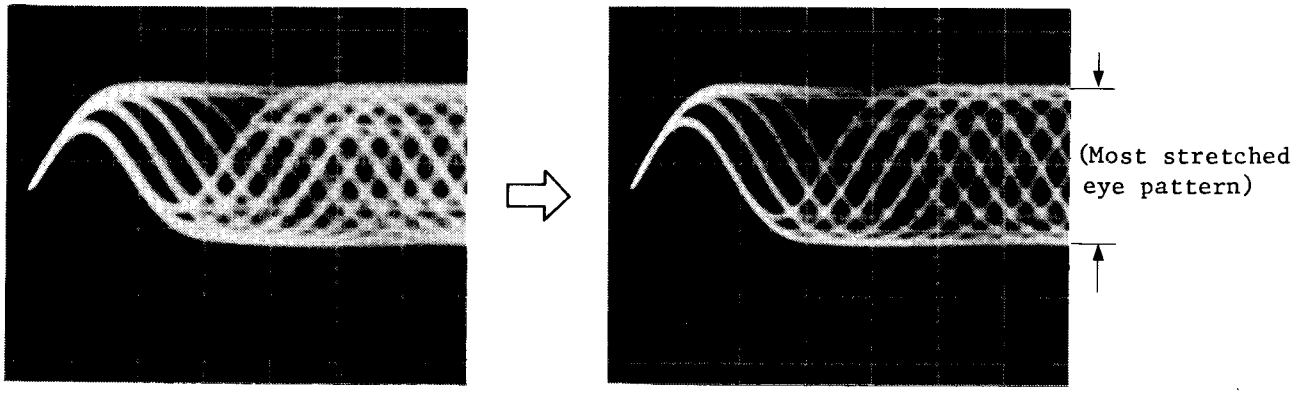


Fig. 4-10 Best eye

(7) Turn off the power supply switch of the player.

D. Focus Offset Adjustment

(1) Connect CH-1 of the oscilloscope to the terminal C305 (either right or left legs) on the LSI Modul PCB, and CH-2 to the terminal TJ102 (Focus offset Test Point) on the Servo PCB.
Connect GND of the oscilloscope to the IC-11 Ground Point on the Main PCB.

		C305 (CH-1)	TJ102 (CH-2)
Oscilloscope setting ---	Volt	: 500mV	100mV
	Sweep	: 0.5 μsec.	
	Input Selector	: AC	DC
	Mode	: NORM (Triggering Via CH-1).	

(2) Turn on the power supply switch of the player.

(3) Place the test disc (SZZP1014F) in to the disc holder by open/close key.

(4) The player to the play mode.

(5) Play TR8 or 13 (BS 0.5 mm) of the test disc (SZZP1014F).

(6) Check the waveforms of CH-1 and CH-2 on the oscilloscope and adjust VR105 so that the waveform around the triggering point shall be as illustrated Fig. 4–11.

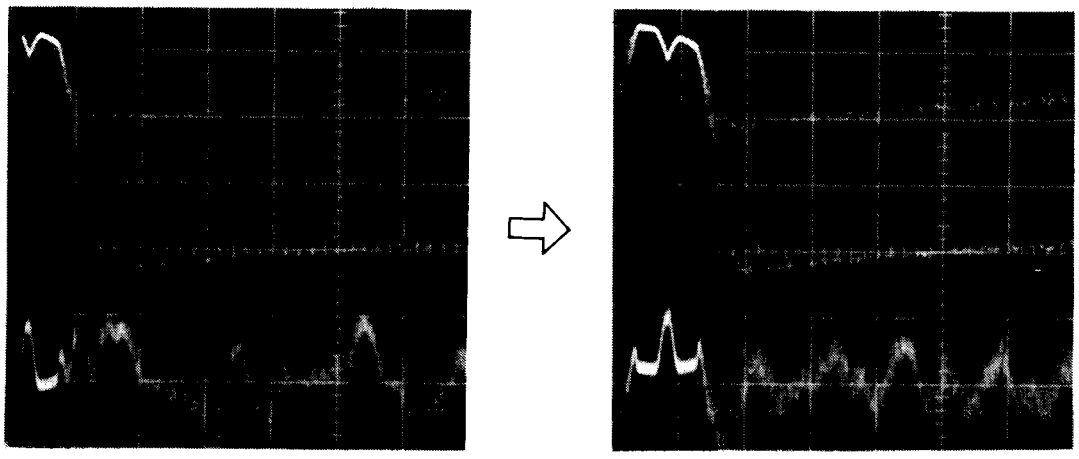


Fig. 4-11. Focus offset

(7) Turn off the power supply switch of the player.

E. Tracking Offset Adjustment

(1) Connect CH-1 of the oscilloscope to the terminal C305 (either right or left legs) on the LSI module PCB and CH-2 to the terminal TJ101 (Tracking offset test point) on the Servo PCB.
Connect GND of the oscilloscope to the IC-11 ground point of the main PCB.

		C305 (CH-1)	TJ101 (CH-2)
Oscilloscope Setting--	Volt	: 500 mV	100mV
	Sweep	: 0.5μ sec	
	Input selector	: AC	DC
	Mode	: NORM (Triggering Via CH-1)	

(2) Turn on the power supply switch of the player.

(3) Place the test disc (SZZP1014F) in to the disc holder by open/close key.

(4) The player to the play mode.

(5) Play TR8 or 13 of the test disc (SZZP1014F).

(6) Check CH-1 and CH-2 waveforms displayed on the oscilloscope and adjust VR103 so that the waveforms shall be as illustrated Fig. 4-12

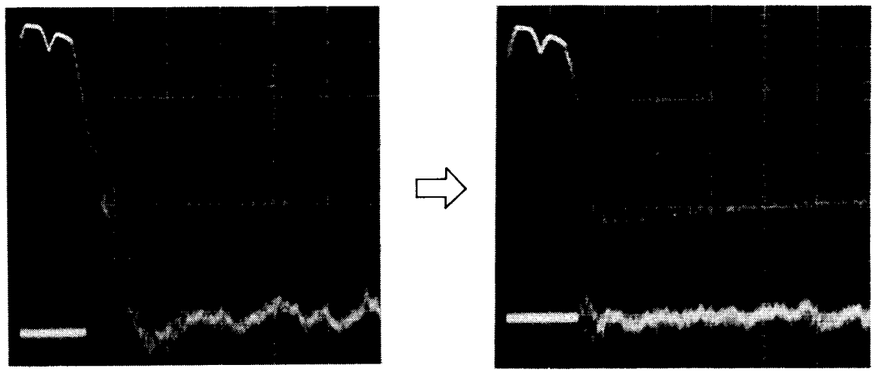


Fig. 4-12 Tracking offset

(7) Turn off the power supply switch of the player.

F. PLL Adjustment

(1) Connect CH-1 of the oscilloscope to the terminal C803 (either of right and left legs) of the main PCB and the terminal GND of the chassis.

Oscilloscope setting---	Volt	: 1.0 V
	Sweep	: 1 msec.
	Input selector	: DC

(2) Turn on the power supply switch of the player.

(3) Place the test disc (SZZP1014F) in to the disc holder by open/close key.

(4) The player to the play mode.

(5) Play TR8 or 13 (BS 0.5 mm) of the test disc (SZZP1014F).

(6) Check the waveform displayed on the oscilloscope and adjust VR701 in the following steps.

ⓐ Turn VR701 upwards slowly and learn the point at which the waveform on the oscilloscope begins to be disturbed disturbed as shown Fig. 4-14 NG.
ⓑ Turn VR701 downwards slowly (opposite direction to that in the above para. "a") and learn the point at which the waveform on the oscilloscope begins to be disturbed.
ⓒ Set VR701 in the middle between the points learned in the above steps "a" and "b".

Example:

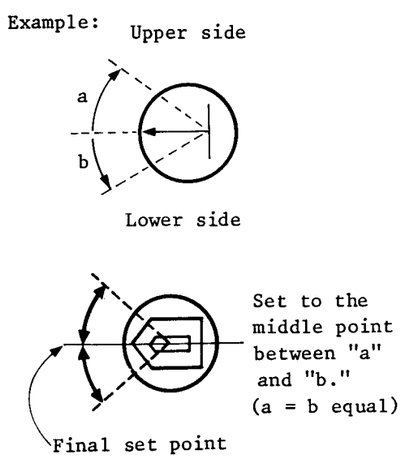


Fig. 4-13 Adjust point

NG OK

Fig. 4-14 PLL

(7) Turn off the power supply switch of the player.

G. Check of play operation after adjustment

Check of skip search
1. Play an ordinary disc.
2. Press the skip button and check to see that skip search is given. (Forward and reverse)

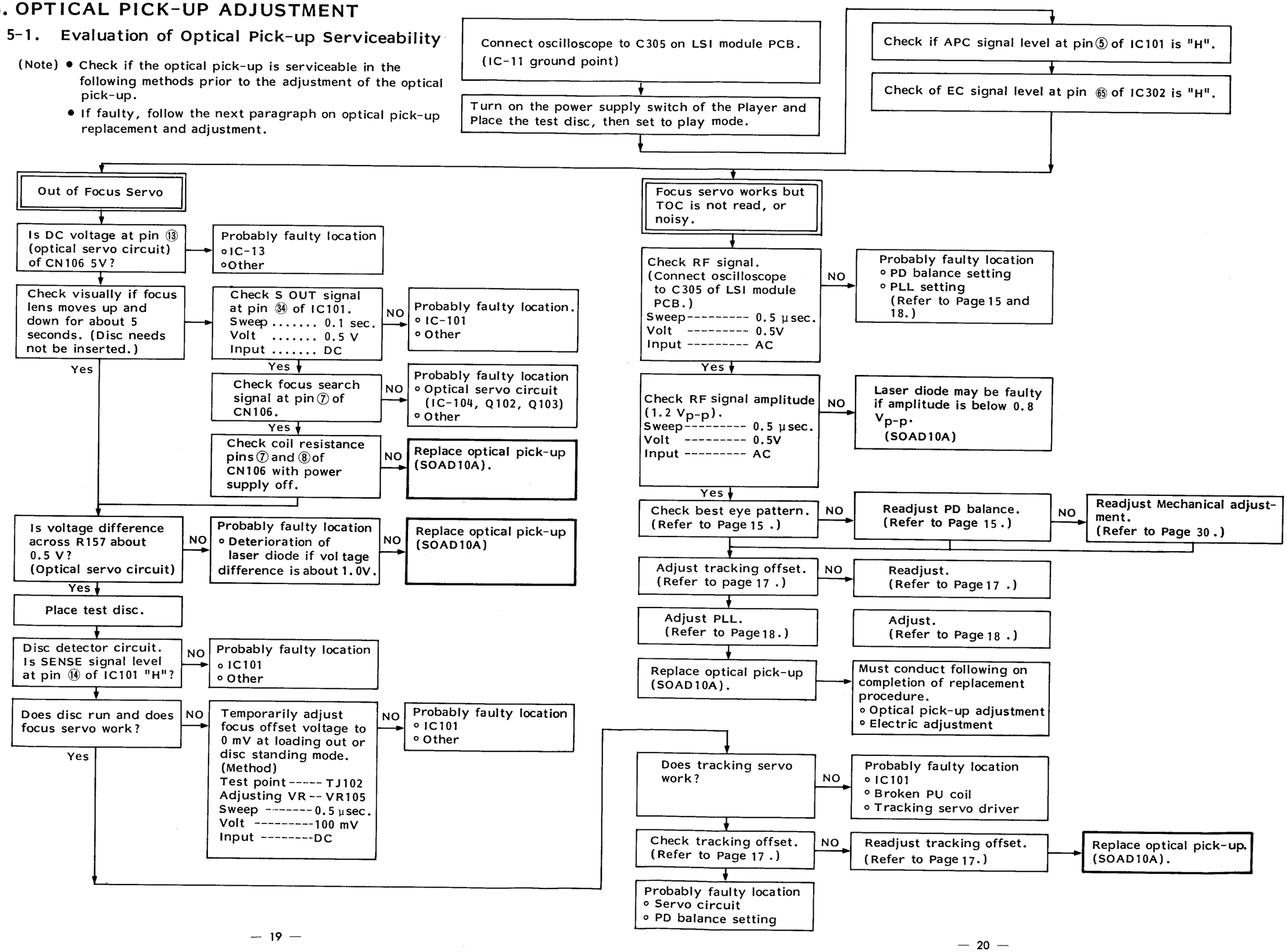
Check of manual search
1. Play an ordinary disc
2. Press the manual search button and check to see that smooth manual search can be done at low and high speeds. (Forward and reverse)

Check for defects
1. Play the band 8 or 13 of test disc, and check to see that there is no sound skip or noise. (Black spot)
2. Play the band 10 or 14 of test disc, and check to see that there is no sound skip or noise. (Fingle print)

5. OPTICAL PICK-UP ADJUSTMENT

5-1. Evaluation of Optical Pick-up Serviceability

(Note) • Check if the optical pick-up is serviceable in the following methods prior to the adjustment of the optical pick-up.
• If faulty, follow the next paragraph on optical pick-up replacement and adjustment.


Connect oscilloscope to C305 on LSI module PCB. (IC-11 ground point)
Turn on the power supply switch of the Player and Place the test disc, then set to play mode.
Check if APC signal level at pin ⑤ of IC101 is "H".
Check of EC signal level at pin ⑮ of IC302 is "H".
Out of Focus Servo
Is DC voltage at pin ⑬ (optical servo circuit) of CN106 5V?
Probably faulty location ∘IC-13 ∘Other
Check visually if focus lens moves up and down for about 5 seconds. (Disc needs not be inserted.)
Yes
Check S OUT signal at pin ㉞ of IC101. Sweep ..... 0.1 sec. Volt ..... 0.5 V Input ..... DC
NO
Probably faulty location. ∘ IC-101 ∘ Other
Yes
Check focus search signal at pin ⑦ of CN106.
NO
Probably faulty location ∘ Optical servo circuit (IC-104, Q102, Q103) ∘ Other
Yes
Check coil resistance pins ⑦ and ⑧ of CN106 with power supply off.
NO
Replace optical pick-up (SOAD10A).
Is voltage difference across R157 about 0.5 V? (Optical servo circuit)
NO
Probably faulty location ∘ Deterioration of laser diode if voltage difference is about 1.0V.
NO
Replace optical pick-up (SOAD10A)
Yes
Place test disc.
Disc detector circuit. Is SENSE signal level at pin ⑭ of IC101 "H"?
NO
Probably faulty location ∘ IC101 ∘ Other
Does disc run and does focus servo work?
NO
Temporarily adjust focus offset voltage to 0 mV at loading out or disc standing mode. (Method) Test point ----- TJ102 Adjusting VR -- VR105 Sweep -------0.5 µsec. Volt ---------100 mV Input --------DC
NO
Probably faulty location ∘ IC101 ∘ Other
Yes
Focus servo works but TOC is not read, or noisy.
Check RF signal. (Connect oscilloscope to C305 of LSI module PCB.) Sweep--------- 0.5 µsec. Volt --------- 0.5V Input --------- AC
NO
Probably faulty location ∘ PD balance setting ∘ PLL setting (Refer to Page 15 and 18.)
Yes
Check RF signal amplitude (1.2 Vp-p). Sweep--------- 0.5 µsec. Volt --------- 0.5V Input --------- AC
NO
Laser diode may be faulty if amplitude is below 0.8 Vp-p. (SOAD10A)
Yes
Check best eye pattern. (Refer to Page 15 .)
NO
Readjust PD balance. (Refer to Page 15 .)
NO
Readjust Mechanical adjustment. (Refer to Page 30 .)
Adjust tracking offset. (Refer to page 17 .)
NO
Readjust. (Refer to Page 17 .)
Adjust PLL. (Refer to Page 18.)
Adjust. (Refer to Page 18 .)
Replace optical pick-up (SOAD10A).
Must conduct following on completion of replacement procedure. ∘ Optical pick-up adjustment ∘ Electric adjustment
Does tracking servo work?
NO
Probably faulty location ∘ IC101 ∘ Broken PU coil ∘ Tracking servo driver
Check tracking offset. (Refer to Page 17 .)
NO
Readjust tracking offset. (Refer to Page 17.)
Replace optical pick-up. (SOAD10A).
Probably faulty location ∘ Servo circuit ∘ PD balance setting

6. HOW TO HANDLING OPTICAL PICK-UP

The laser diode in the optical pick-up may be damaged by potential difference caused by static charge on clothing or body. Pay careful attention to damage by static charge when repaired.

■ Handling of Optical Pick-up

1. Don't give a heavy shock to the optical pick-up which is very precisely constructed.
2. A charge prevention pin is inserted in the flexible PCB for preventing damage to the laser diode. The pin should be removed or installed in a short time.
3. Handle the flexible PCB with care because PCB may be cut if an excessive stress is applied.
4. Don't meddle with the laser power adjusting VR which is adjusted prior to shipping.

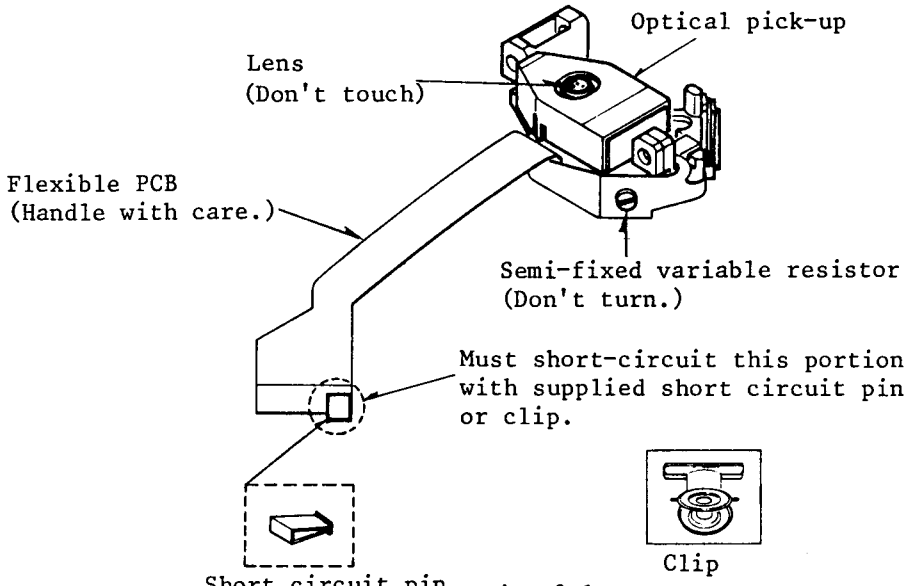


Fig. 6-1

■ Grounding for Preventing Static Charge Damge

1. Body Grounding

   Put on the charge preventing wrist strap for discharging electricity from the body.

2. Working Table Grounding

   Lay electrically conductive material (conductive sheet) or an iron plate on the table where the optical pick-up is placed, and ground the material or sheet to the floor.

Note: Static charge of clothing is not discharged from the wrist strap. Exercise care so that clothing shall not touch the wrist strap.

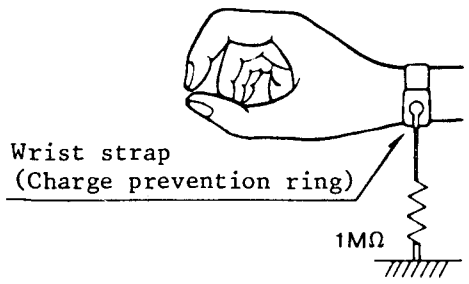


Fig. 6-2

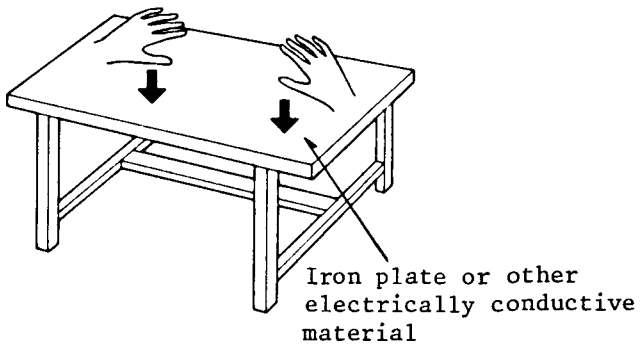


Fig. 6-3

7. OPTICAL PICK-UP REPLACEMENT PROCEDURE

Note • Exercise care so that disassembled parts shall not be lost.

• Set up the player so that it can be power on checked as shown in Fig. 7-1 according to the disassembly procedure outlined in the service manual.

7-1. Power on check status

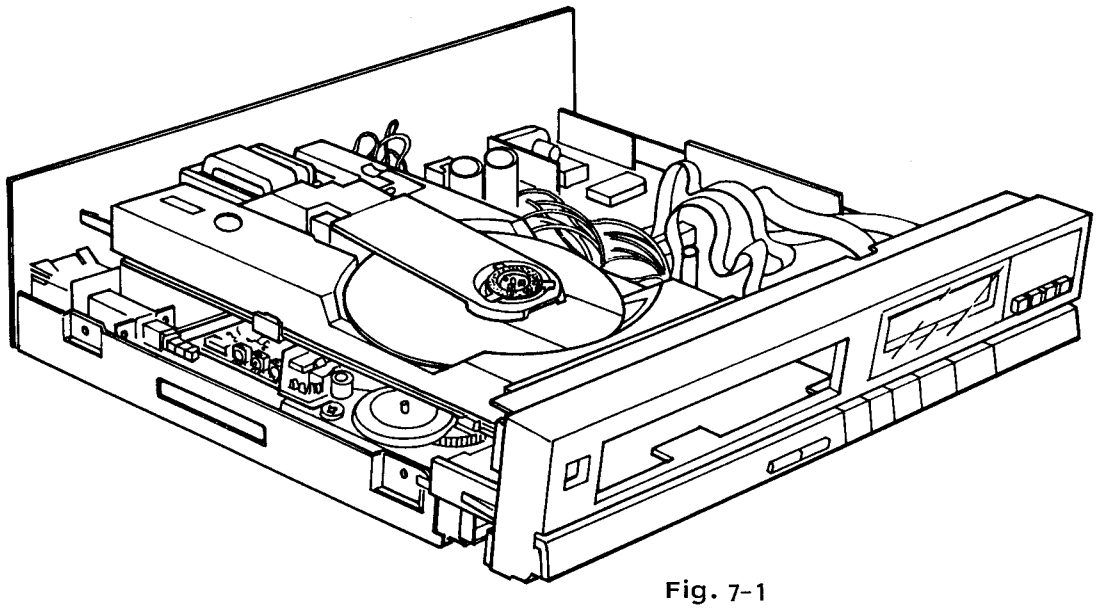


Fig. 7-1

7-2. Removal of Traverse Unit (Optical Deck Unit)

ⓐ Remove one screw fastening the traverse unit.

ⓑ Remove the traverse unit by lifting it in the direction shown by the arrow.
Exercise care because the leads connectors (CN501, BT101, BT102, BT103) from the servo circuit are connected to the main PCB at the time.

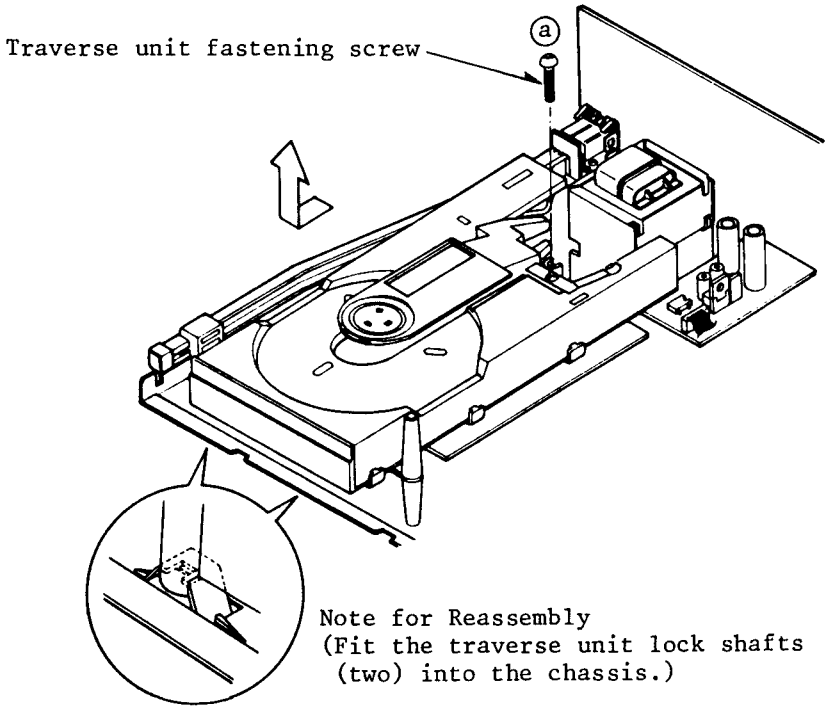


Fig. 7-2

7-3. Separation of Traverse Unit and Optical Pick-up

ⓐ Place soft cloth etc. between the traverse unit and the chassis for preventing short circuit and scratches etc.
(Stick a tape to the ornament plate of the disc holder for sure.)

ⓑ Put upside down and set the traverse unit in the chassis as shown in Fig. 7-3.
The leads connector need not be disconnected.

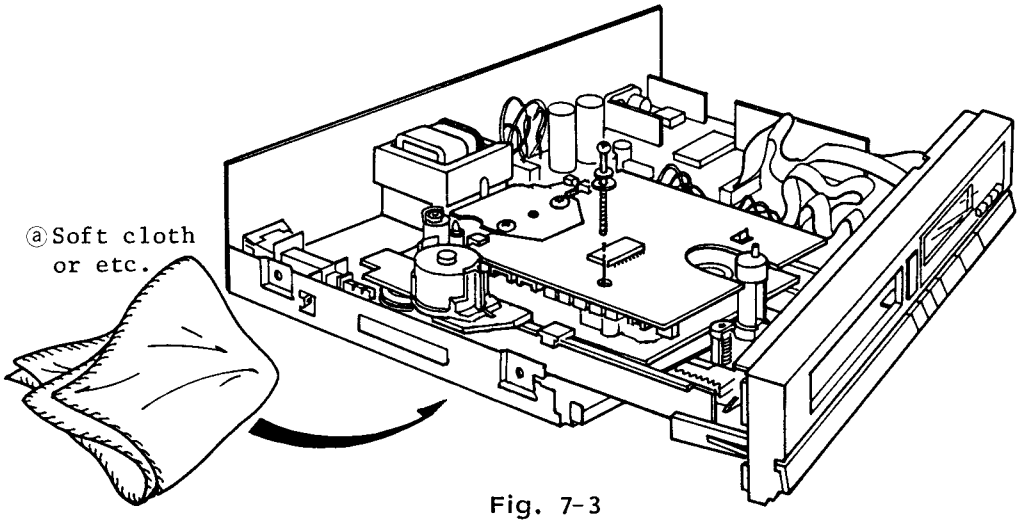


Fig. 7-3

ⓒ Disconnect four connectors CN101, CN102, CN103 and CN104.
(Exercise extreme care in reassembly so that the connectors shall not be inserted in wrong position.)

②pin Connector from the loading motor	→ CN103	Servo circuit
②pin Connector from the open detection switch	→ CN102	
②pin Connector from the close detection switch	→ CN101	
③pin Connector from position detection resistors	→ CN104	

ⓓ Remove one screw fastening the servo circuit.

ⓔ Unfasten the locking clamp of the servo circuit.

(Note) • Pay carefull attention to the flexible PCB led from the optical pick-up when the PCB of the optical servo circuit is removed.

• Must short-circuit the flexible PCB as specified in Fig. 6-1, when the flexible PCB is disconnected from CN106.

ⓕ Slowly lift up the servo PCB to an adequate position with extreme care to the flexible PCB.

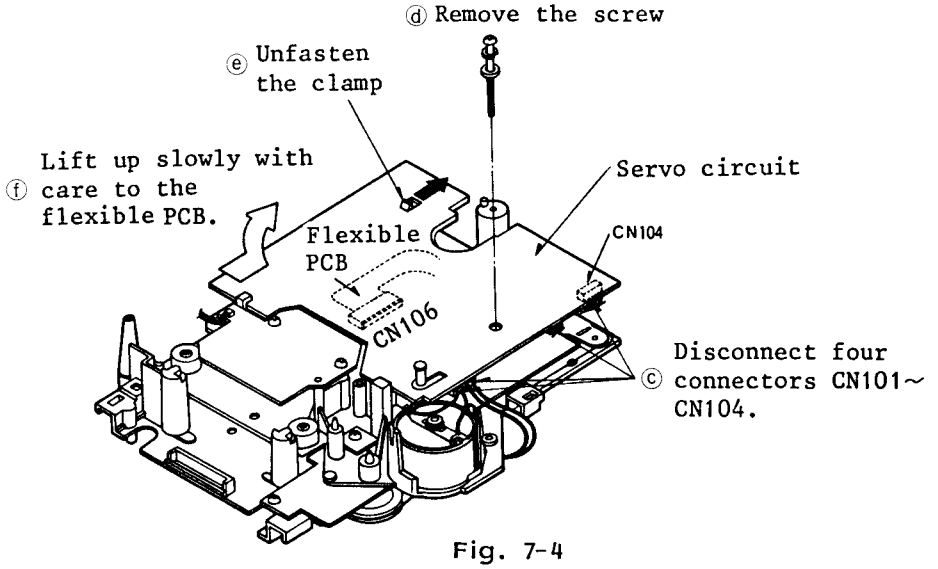


Fig. 7-4

7-4. Removal of Flexible PCB and Servo Circuit CN106 from Optical Pick-up

ⓐ Lift the servo circuit PCB to an adequate position.

ⓑ CN106 is a locking connector. Disconnect the right and left of the lock housing alternately.

ⓒ Hold and remove the reinforce (Fig. 7-5) from the flexible PCB.

Must remove the flexible PCB by holding the reinforce of the FPC cord. If other place is held, the flexible PCB may be damaged.

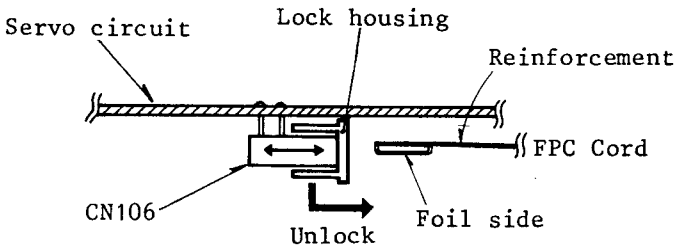


Fig. 7-5

- Set the foil side of the flexible PCB as shown in Fig. when reassembled. If connected with the foil side on the wrong side, the player may be damaged.

(Note) • When the flexible PCB is disconnected from CN106, Voluntary position should be short-circuited as shown in Fig.

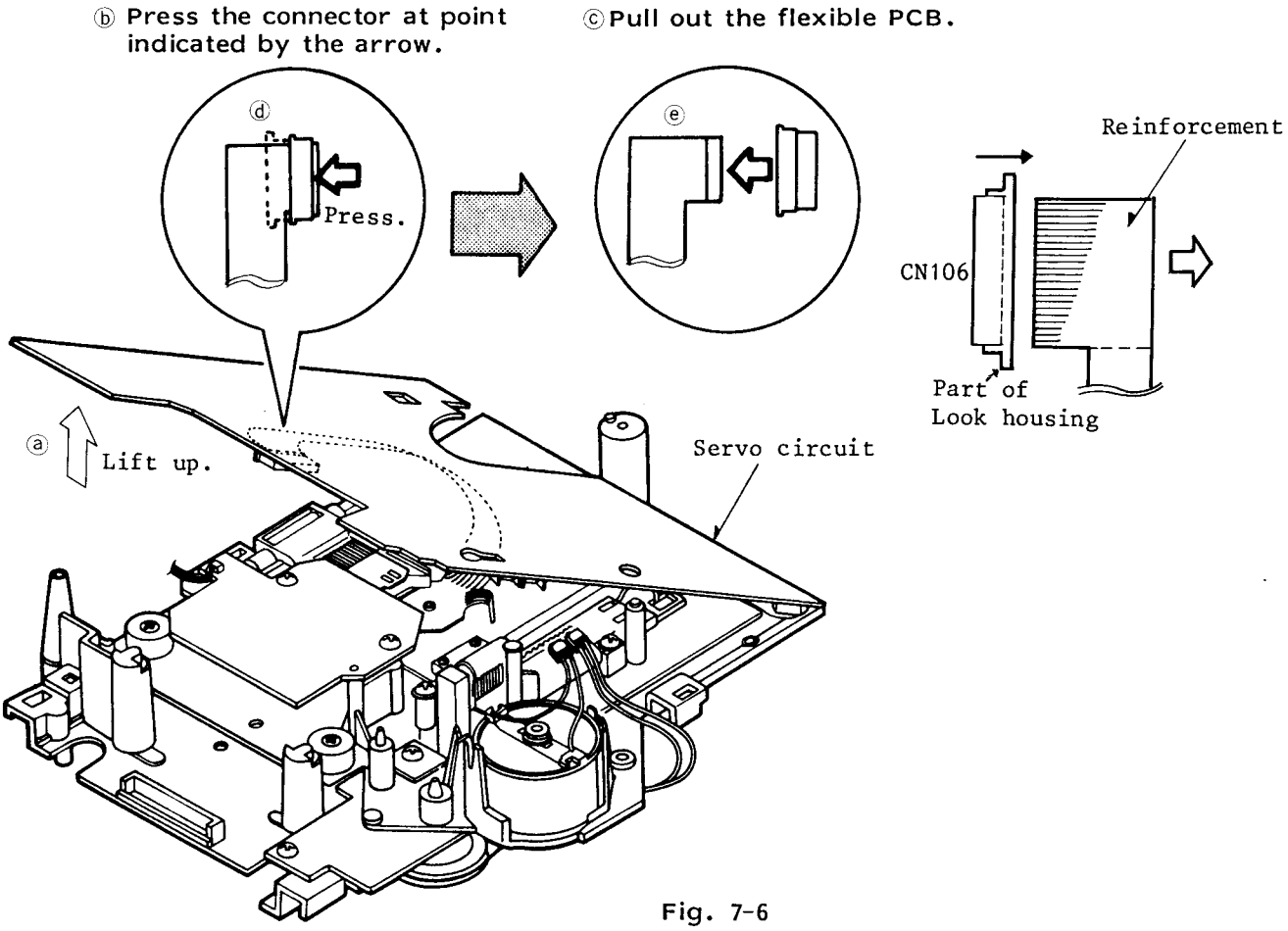


Fig. 7-6

7-5. Removal of Optical Pick-up

ⓐ Remove the six screws fastening the optical pick-up.

ⓑ Set free position the transportation lock lever of the optical pick-up.

ⓒ Separate the optical pick-up and linear traverse drive from the traverse unit.

ⓓ Remove two cushion rubbers.

ⓔ Remove the two guide shafts of the optical pick-up. (In reassembly, clean the guide shafts because they are sliding contact parts of the optical pick-up. The guide shafts need not be coated with grease.)

ⓕ Detach two linear drive coils by a soldering iron. (Pay extreme attention to the orientation of the coils in reassembly, then have directivity.)

ⓖ Remove the four screws fastening the linear drive coil to the optical pick-up.

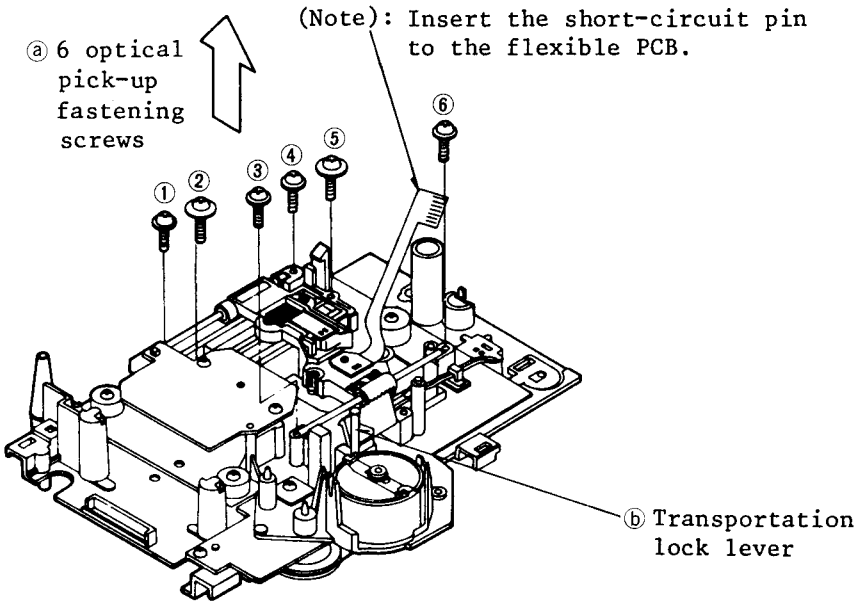


Fig. 7-7

Separate

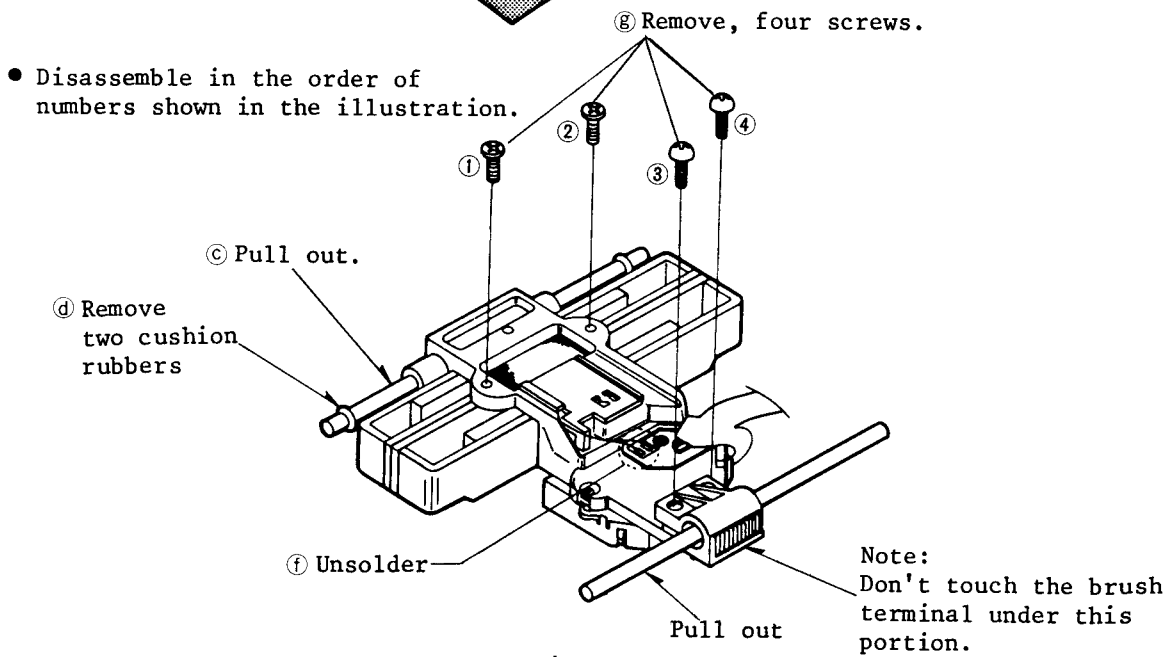


Fig. 7-8

7-6. Removal of Drive Coil

ⓐ Remove two yokes. (The yokes have no directivity.)

ⓑ Remove the drive coil.

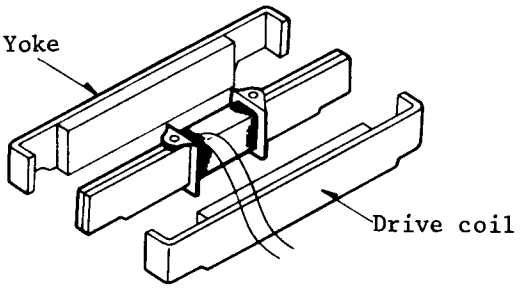


Fig. 7-9

DC resistance of drive coil
about 36Ω ±1.5Ω

- Installation of drive coil
  Solder the marking side of the coil to ⓐ and the no-marking side to ⓑ.

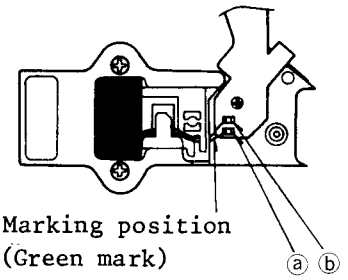


Fig. 7-10

7-7. Installation of Optical Pick-up

Install the optical pick-up in the reversed order of the disassembling steps so that power-on check can be conducted as shown in Fig. 7-11. However, don't install one screw fastening the servo circuit PCB. Strictly observe the notes shown in the disassembling procedure.

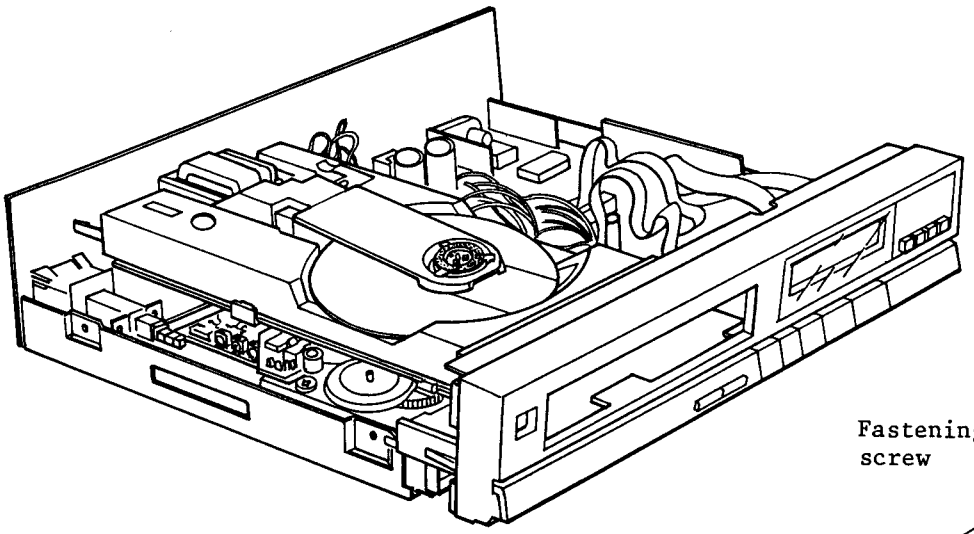


Fig. 7-11

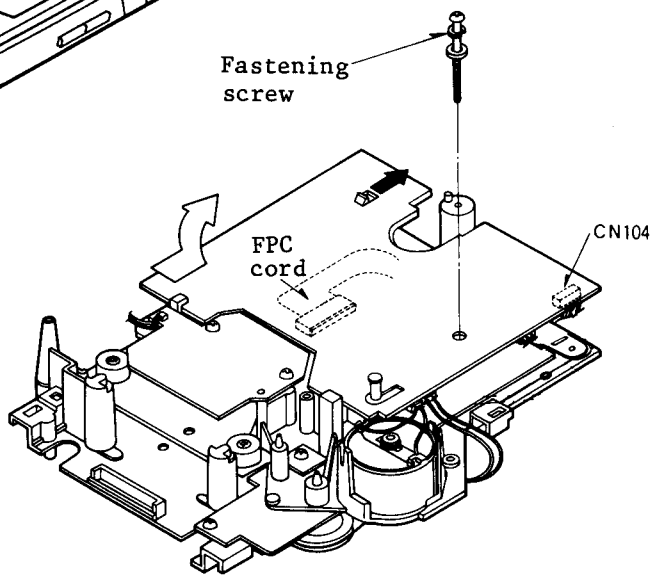


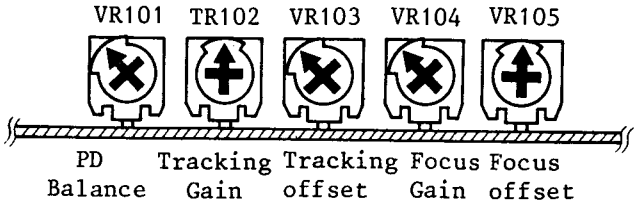
Fig. 7-12

8. ADJUSTING PROCEDURE OF OPTICAL PICK-UP

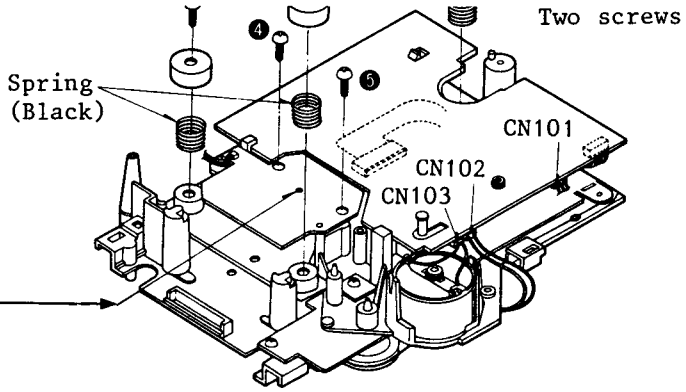
8-1. Adjusting steps and Points of optical pick-up

Set up player according to disassembling procedure so that power-on check can be conducted.

Temporarily set adjusting variable resistors on servo PCBs.

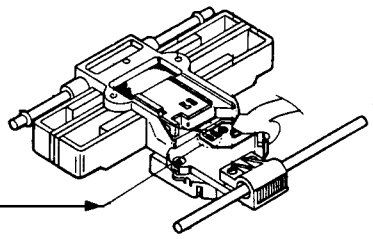


Adjust turntable height.



Mechanical adjustment

Note: Don't tamper with this screw.



Electric adjustment

8-2. Required Measuring Instruments and Tools

1. Two-channel oscilloscope (with external trigger), over 30 MHz.
2. Test desc (SZZP1014F)
3. Allen wrench ---------- 1.5 mm (SZZP1044C)
4. General tools

A. Turn Table Height Adjustment

(1) Turn on the power supply switch of the player.

(2) Place the test disc (SZZP1014F) to the disc holder.

(3) Turn off the power supply switch of the player.

(4) Set the oscilloscope to DC zero balance.

(5) Connect the CH-1 of the oscilloscope to TJ102 of the servo circuit and GND to the chassis.

Oscilloscope settings --
- Sweep : 5m sec.
- Volt : 100mV
- Input selector : DC

(6) Turn on the power supply switch of the player.

(7) Play back a desired track.

(8) Hold the traverse unit (optical deck unit) by the hands as shown in Fig. 8-1 with care not to give vibration to the traverse unit.

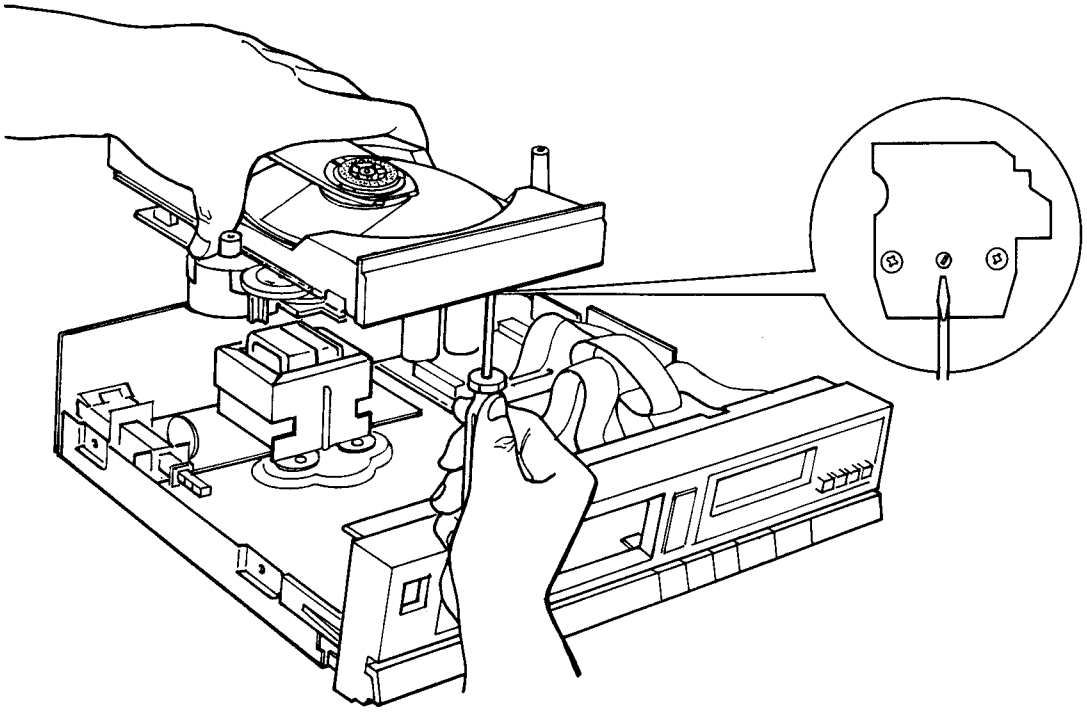


Fig. 8-1.

(9) Turn the adjusting screw on the underside of the spindle motor PCB by a flat screwdriver so that the waveform at TJ102 shall be 0 ± 50 mV as shown in Fig. 8-2.

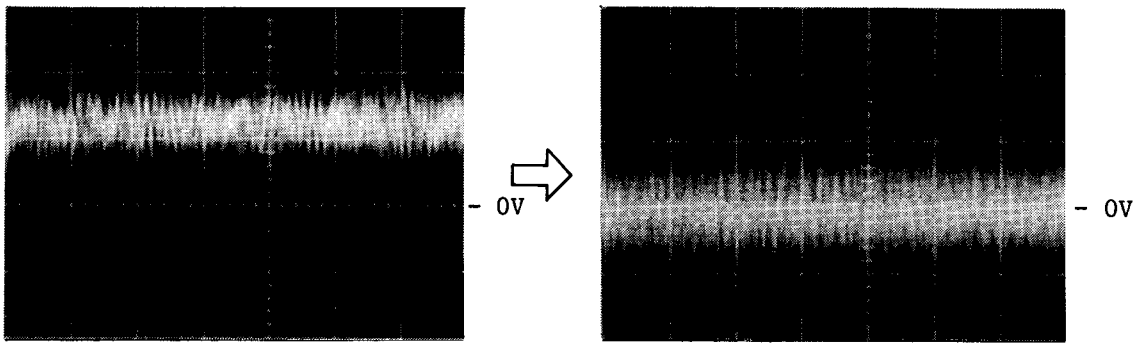


Fig. 8-2

(10) Turn off the power supply switch of the player.

(11) Lock the adjusting screw with "Neji Lock (like a nail paint)" or a bond on completion of adjustment.

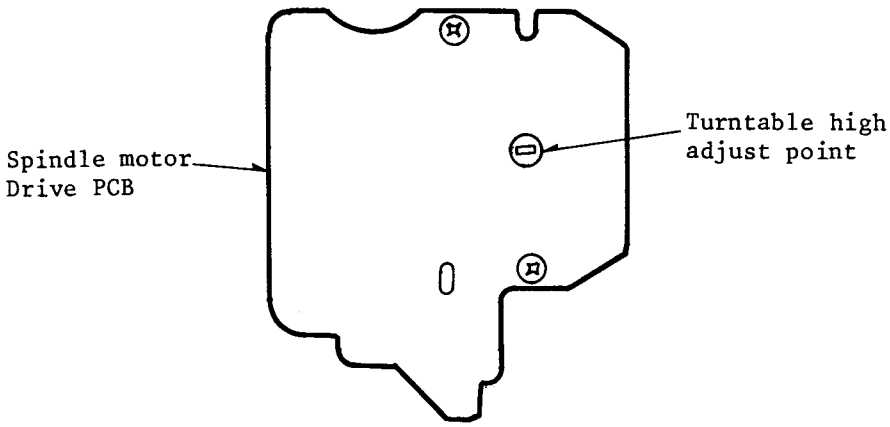


Fig. 8-3

(Note)

Adjust turntable height by paying attention to the adjusting screw because the screw is plastic. Replace the screw (Part No.:SNSD3) if the screw is marred.

B. Mechanical Adjustment

(1) Turn on the power supply switch of the player.

(2) Insert the test disc (SZZP1014F) in the disc holder.

(3) Turn off the power supply switch of the player.

(4) Set the oscilloscope as stated below.

Oscilloscope settings
- Sweep : 0.5 µsec.
- Volt : 0.5V
- Input selector: AC

(5) Connect CH-1 of the oscilloscope to C305 on the LSI module and GND to the IC-11Ⓖ.

(6) Turn on the power supply switch of the player.

(7) Play back TR6 .

(8) Set the player in the playback mode as shown in Fig. 8-4. with care not to give vibration to the traverse unit.

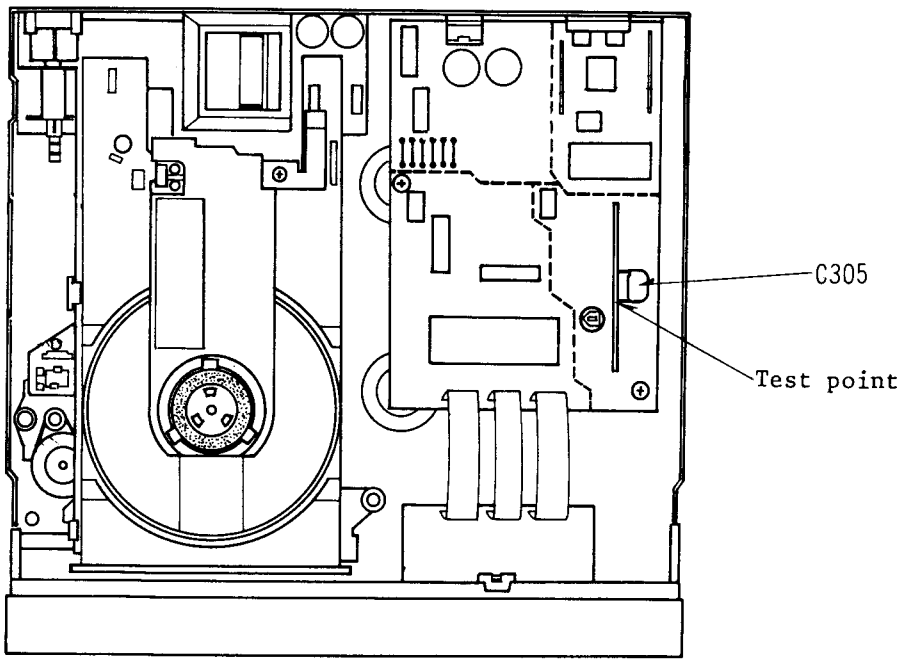


Fig. 8-4

(9) Remove the servo circuit PCB as shown in Fig. 8-5 and check whether or not the two mechanical adjusting screws located on the underside of the pick-up are it should be outside the spindle PCB.
If they are located in a range not adjustable, move the optical pick-up outwards in the skip search mode.

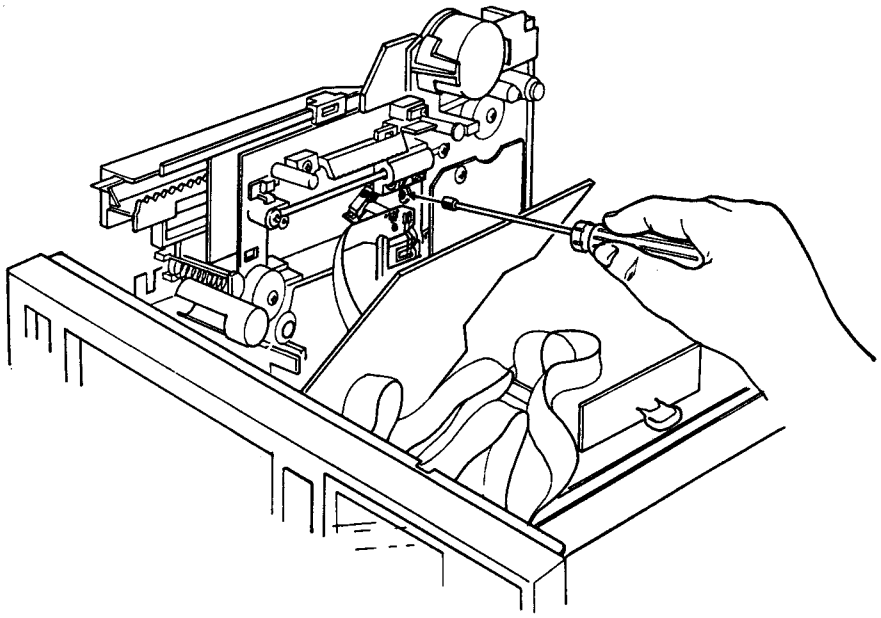


Fig. 8-5

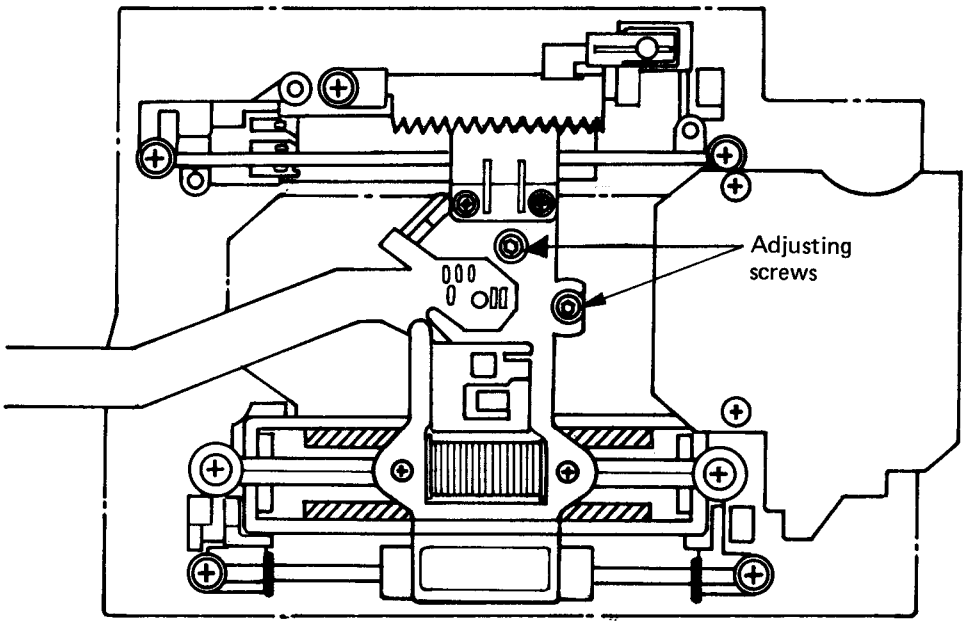


Fig. 8-6

(10) Disconnect the servo circuit connectors (CN101, CN102, and CN103).

(11) Check if the RF signal waveform is as shown in Fig. 8-7. If the waveform can not be checked or is unlike the given waveform, proceed to the following steps.
(SZZP1044C..... 1.5mm)

(12) Set the allen wrench into the socket in the heads of the mechanical adjusting screws shown in Fig. 8-5 and turn the screws right or left to optimum positions. Pay attention to the flexible cord led from the optical pick-up.

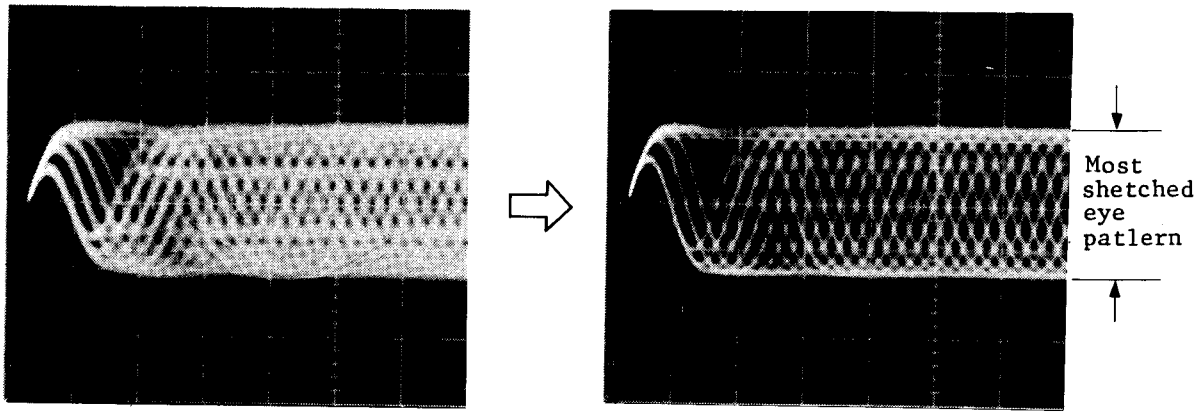


Fig. 8-7

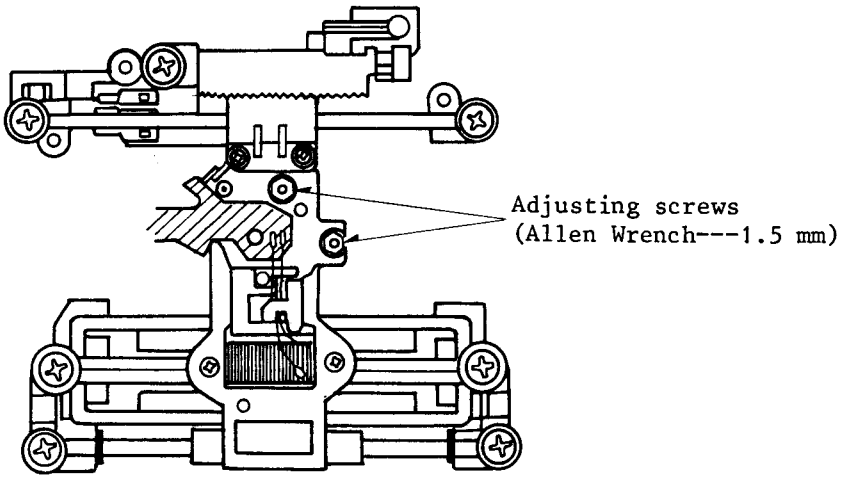


Fig. 8-8

(13) Turn off the power supply switch of the player.

(14) After adjustment dress components C111, C128, C137, C139 and C146 to lay flat on servo circuit PCB and reassemble on the traverse unit, as shown Fig. 8-9.

(15) Connect the connectors of the each detection switches to the servo circuit correctly. (If connected wrong, the power supply circuit and the servo circuit may become faulty.)

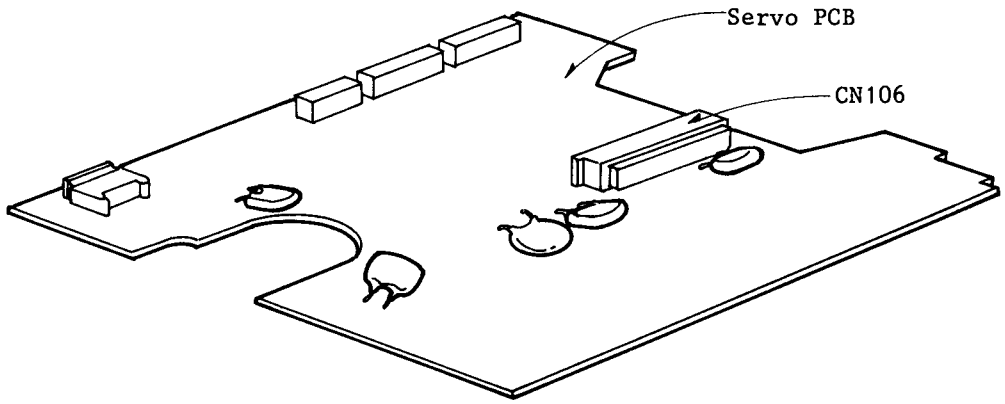


Fig. 8-9

On completion of adjusting the optical pick-up, set the player so that it can be power-on checked as shown in Fig. 8-10 and must conduct electric adjustment.

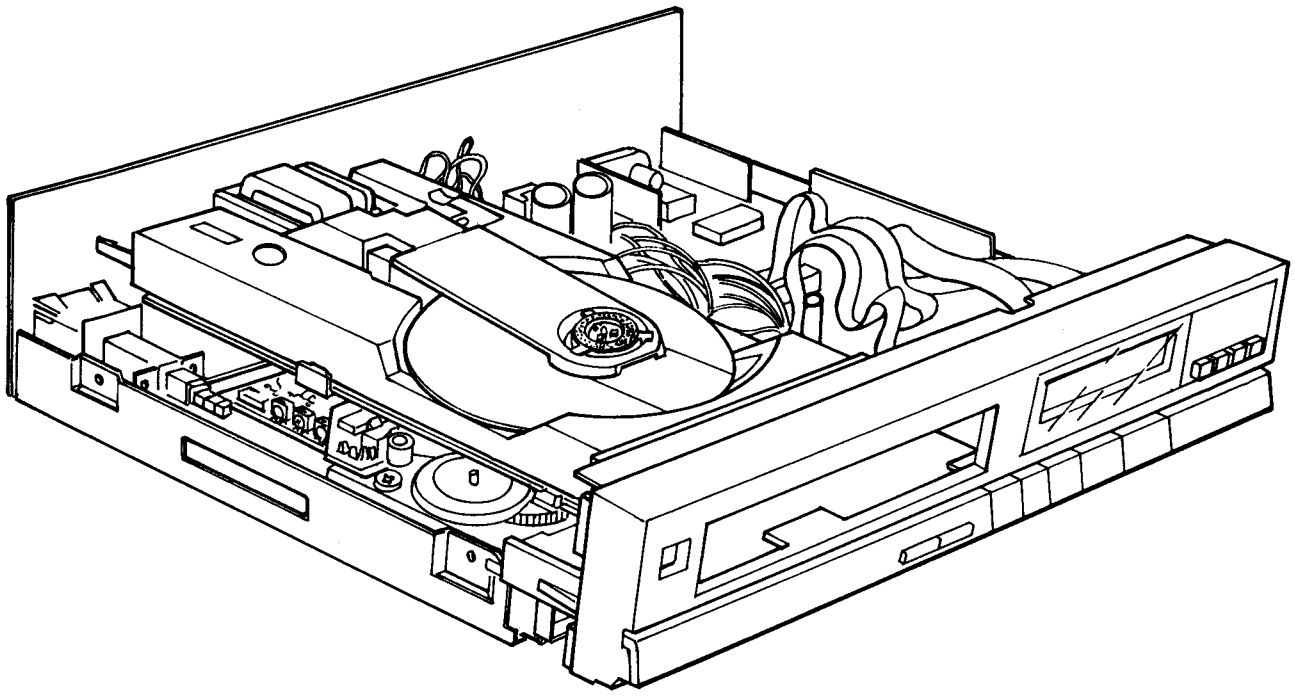


Fig. 8-10

9. PCB CONNECTION DIAGRAM

(Note) Connect each connector according to the PCB wiring diagram, and switch on the power supply.

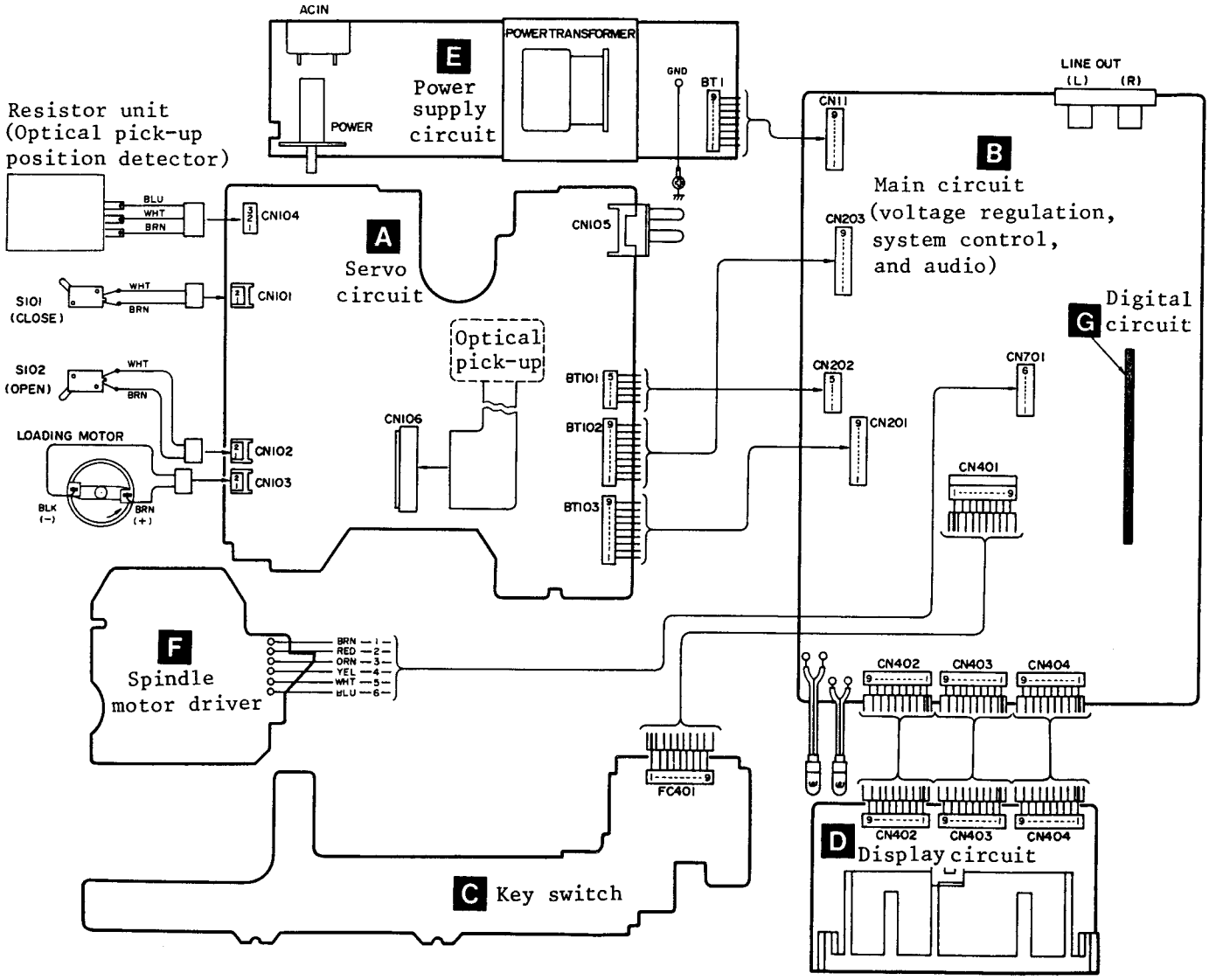
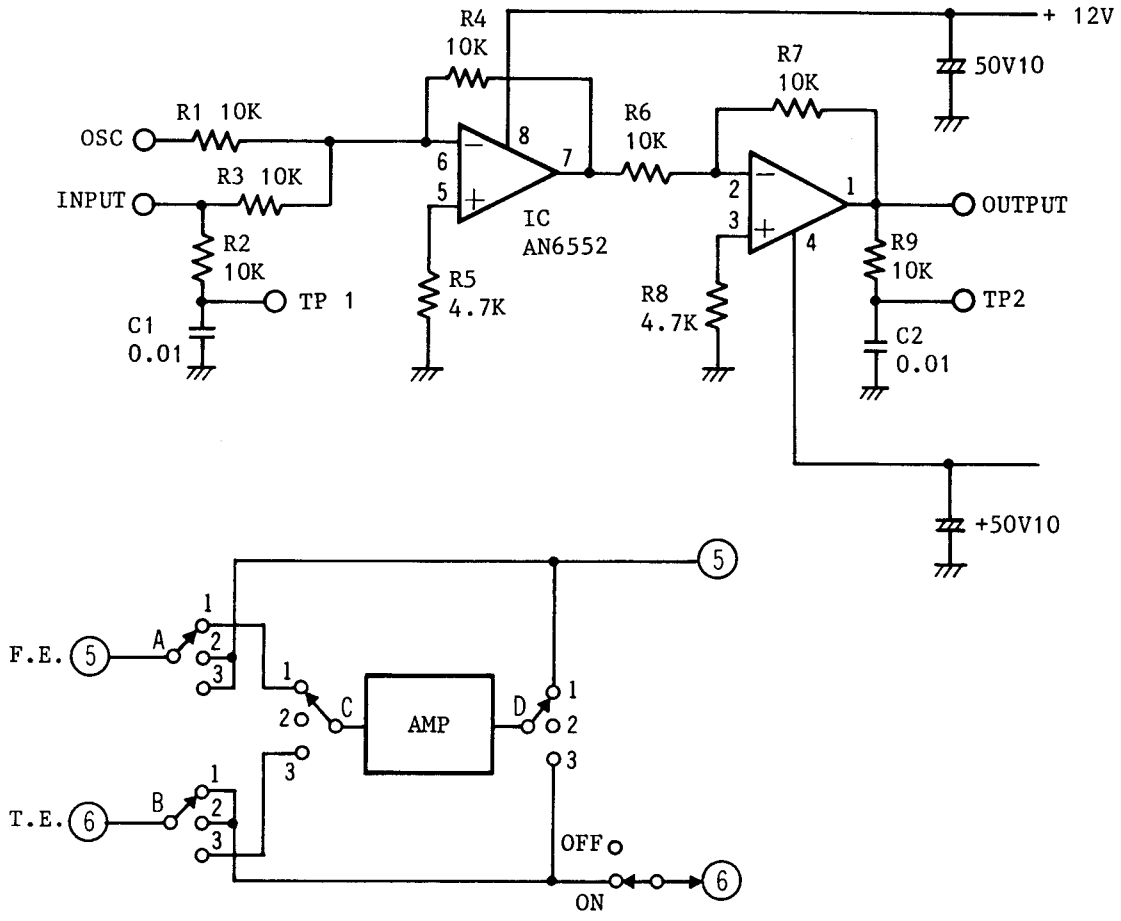


Fig. 9-1.

10. SCHEMATIC DIAGRAM OF SERVO GAIN ADJUSTER (SZZP1017F)



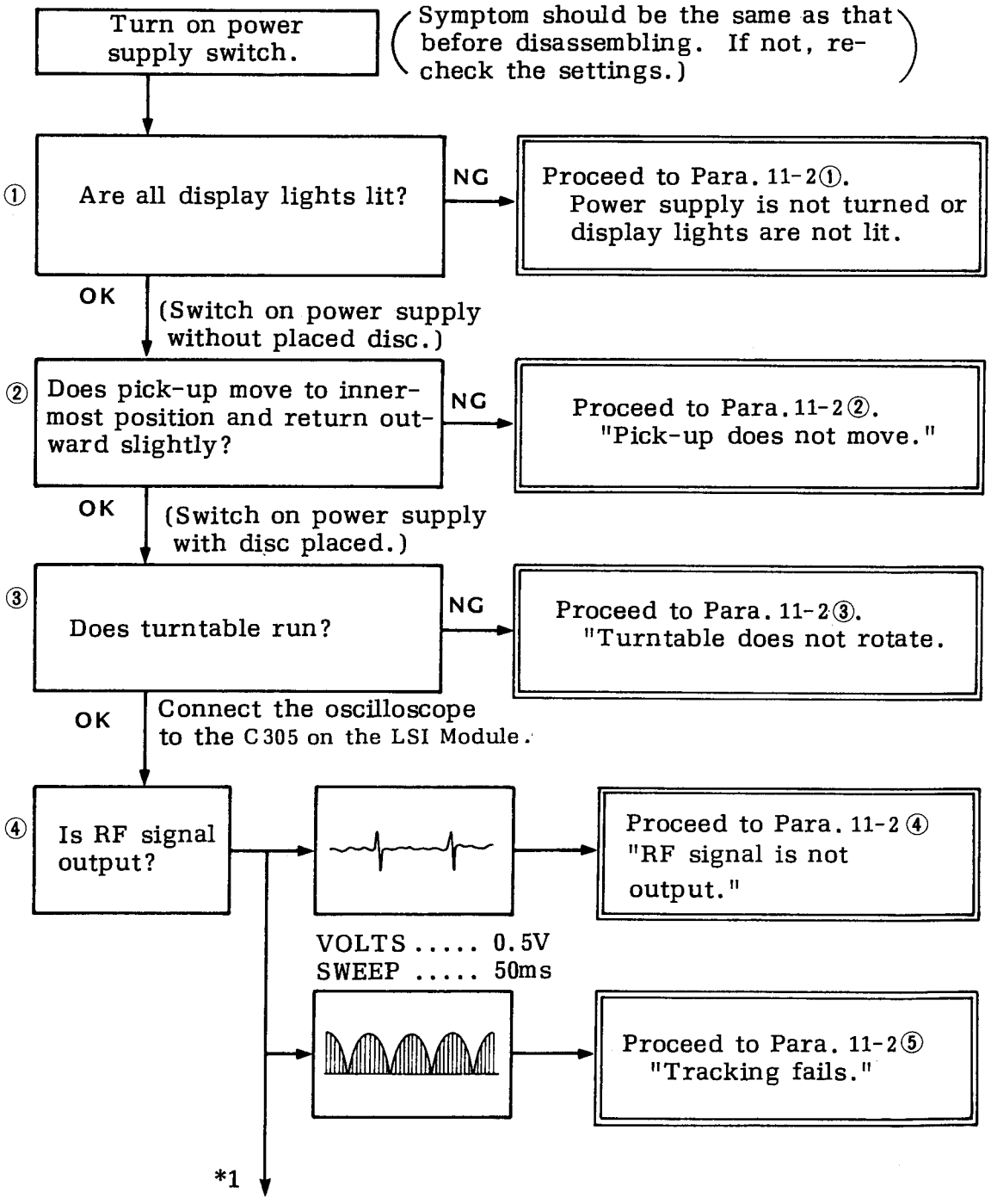
Ref. No.	Part No.	Q'ty
IC	AN6552	1
R 1,2,3,4,6,7,9	ERDS2TJ103	7
R 5,8	ERDS2TJ472	2
C 1,2	ECKD1H103ZF	2
C	ECEA1HU100	2
Connector	SSDJB13BXHA	1
Lead Wire	(180,600mm)	2
3 Wire with		1

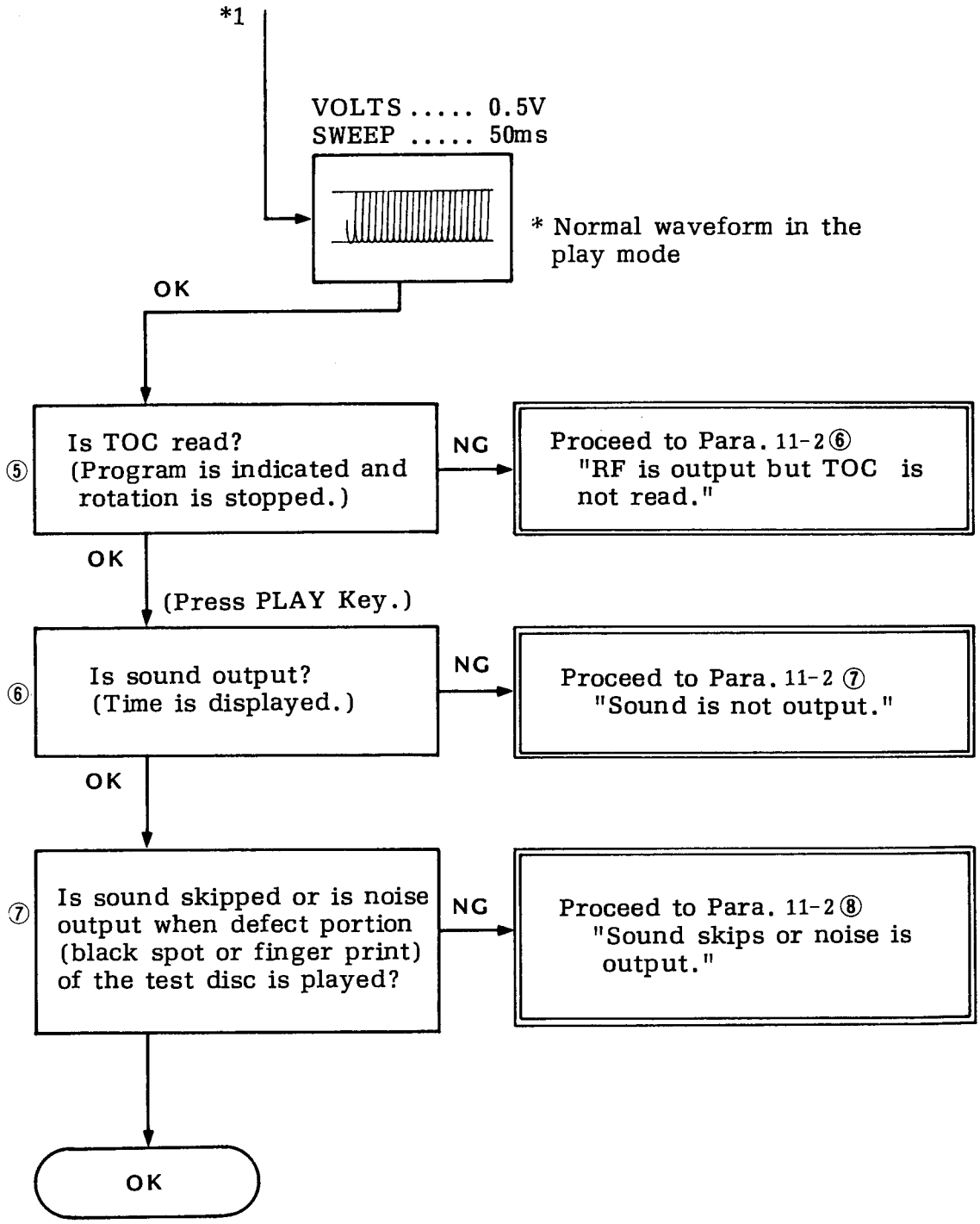
11. TROUBLE SHOOTING PROCEDURE

Check symptoms according to Para. 11-1 when a trouble takes place.

(Note) Positively follow the given steps in the given sequence.
The player shall be set to the power-on check status as shown in Fig. 4-7-A.

11-1. Check of Symptoms


Turn on power supply switch.
(Symptom should be the same as that before disassembling. If not, re-check the settings.)
①
Are all display lights lit?
NG
Proceed to Para. 11-2①. Power supply is not turned or display lights are not lit.
OK
(Switch on power supply without placed disc.)
②
Does pick-up move to inner-most position and return out-ward slightly?
NG
Proceed to Para. 11-2②. "Pick-up does not move."
OK
(Switch on power supply with disc placed.)
③
Does turntable run?
NG
Proceed to Para. 11-2③. "Turntable does not rotate.
OK
Connect the oscilloscope to the C305 on the LSI Module.
④
Is RF signal output?
Proceed to Para. 11-2④ "RF signal is not output."
VOLTS 0.5V
SWEEP 50ms
Proceed to Para. 11-2⑤ "Tracking fails."
*1


*1
VOLTS 0.5V
SWEEP 50ms
* Normal waveform in the play mode
OK
⑤ Is TOC read? (Program is indicated and rotation is stopped.)
NG
Proceed to Para. 11-2⑥ "RF is output but TOC is not read."
OK
(Press PLAY Key.)
⑥ Is sound output? (Time is displayed.)
NG
Proceed to Para. 11-2⑦ "Sound is not output."
OK
⑦ Is sound skipped or is noise output when defect portion (black spot or finger print) of the test disc is played?
NG
Proceed to Para. 11-2⑧ "Sound skips or noise is output."
OK

11-2. Check Method According to symptoms

① Power supply is not turned on or display lights are not lit.

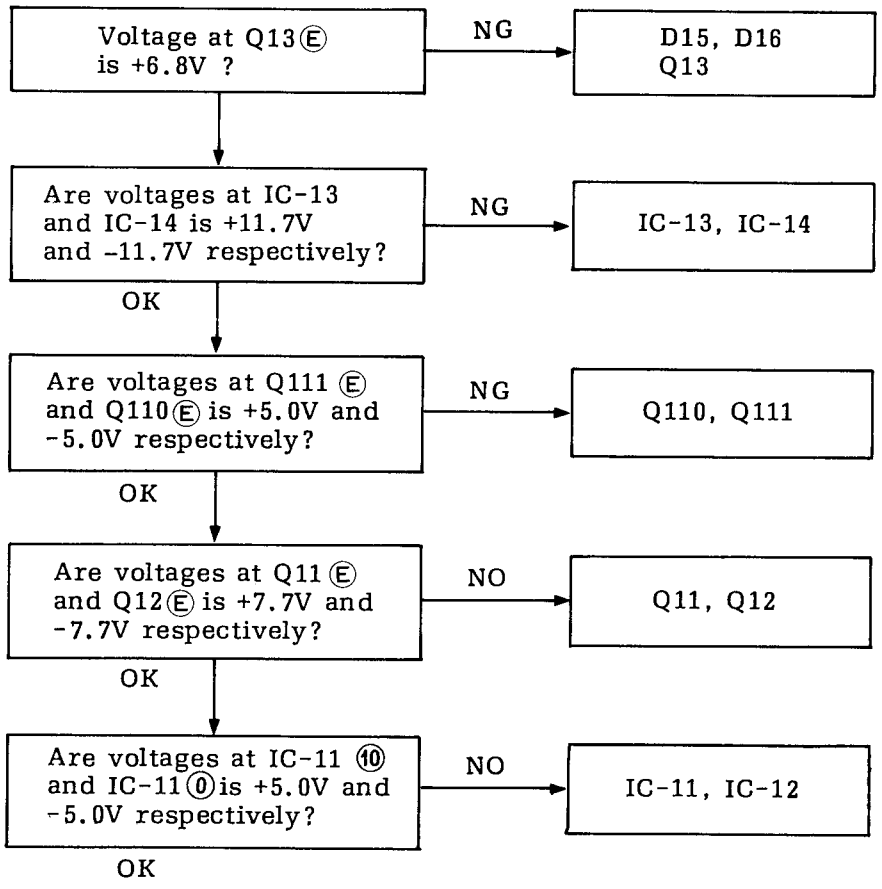
Check Point

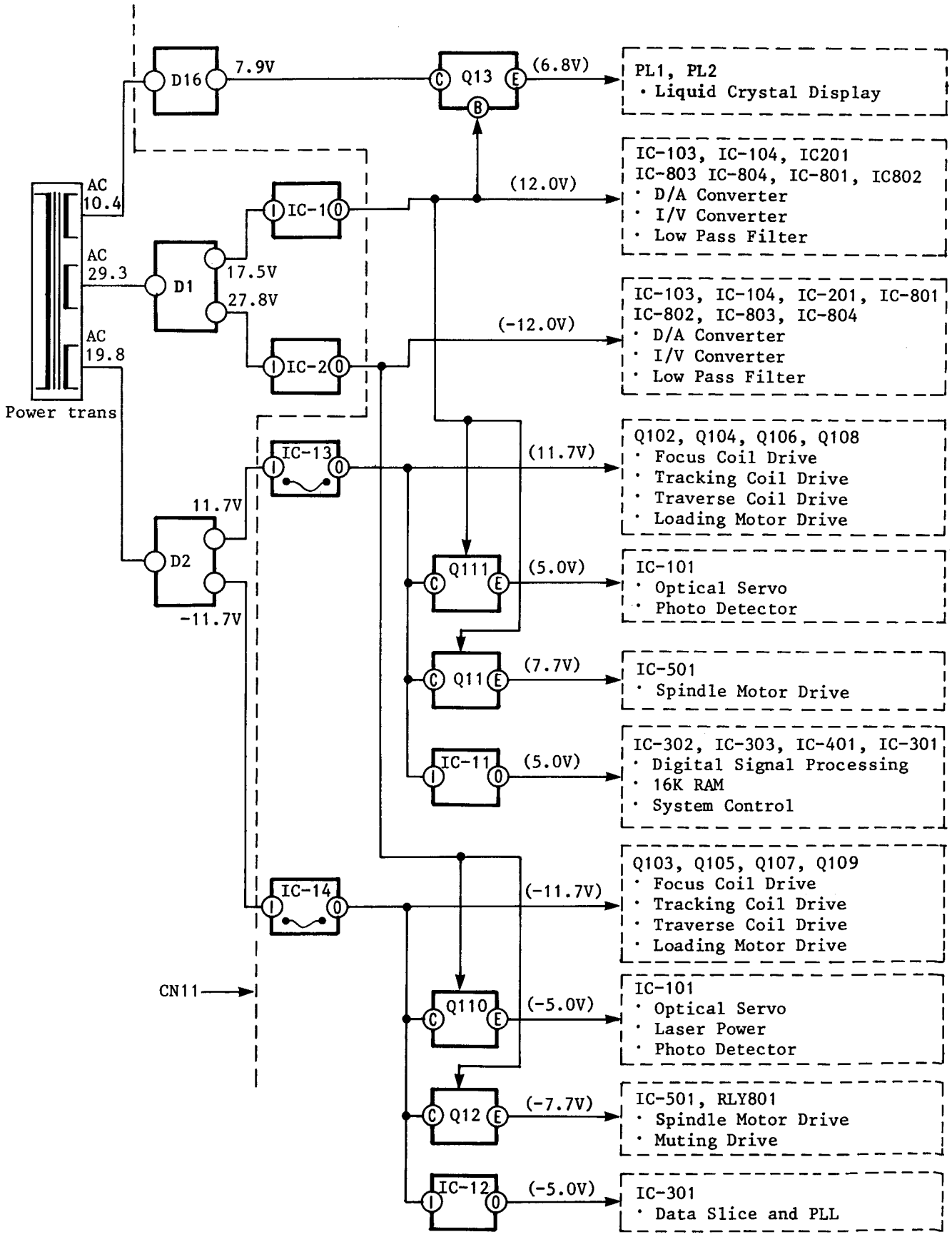
☆ Power supply circuit

Checking Steps and Probable Causes

Check the DC/AC voltage of the connector (CN11) with the oscilloscope.

CN11 Pin No.	Voltage		
①, ②	10.4 V/AC	NO	Power Transformer
④	11.7 V/DC	NO	· D2 · Power Transformer
⑥	-11.7 V/DC	NO	· D2 · Power Transformer
⑦	12.0 V/DC	NO	· IC-1, D1 · Power Transformer
⑨	-12.0 V/DC	NO	· IC-2, D1 · Power Transformer





Voltage of power supply circuit

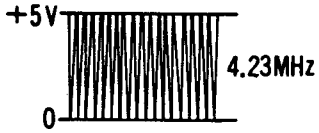
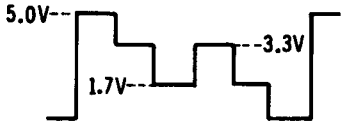
Check Point ..... Display Circuit

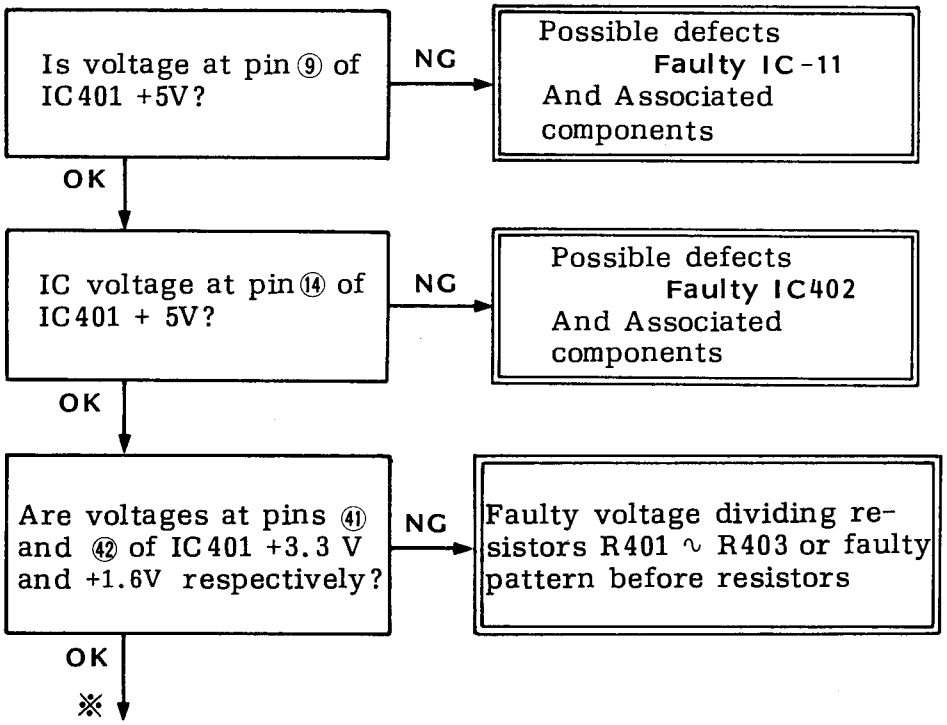
☆ Check the display circuit following the check of the power supply circuit.

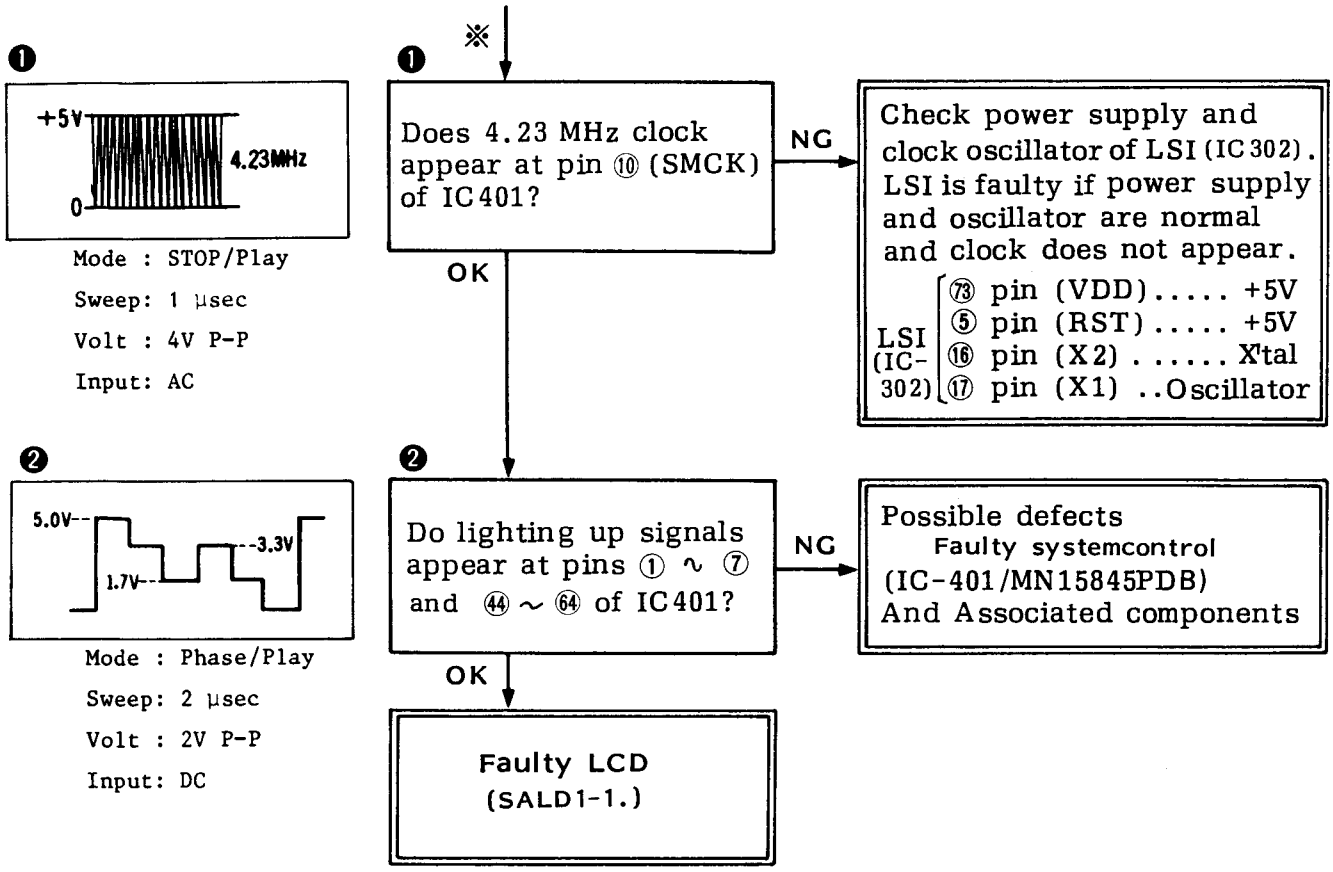
Checking Steps and Probable Causes

Check voltages and waveforms at the pins of the systemcontrol with the oscilloscope.

Systemcontrol (IC401)

Pin No.	Voltage and waveform	Remarks
⑨	+5V	VDD
⑩		Clock at pin 13 of LSI (IC601) (SMCK)
⑭	+5V	$\overline{\text{REST}}$
㊶	+3.3V	LCD driving power supply
㊷	+1.7V	
① ㊹ ~ ⑦ ㊻		(Note) Waveform varies according to type of display





② Traverse mechanism does not move.

Check Point

☆ Check without Place a disc if the pick-up moves in the sequence stated in the table below.

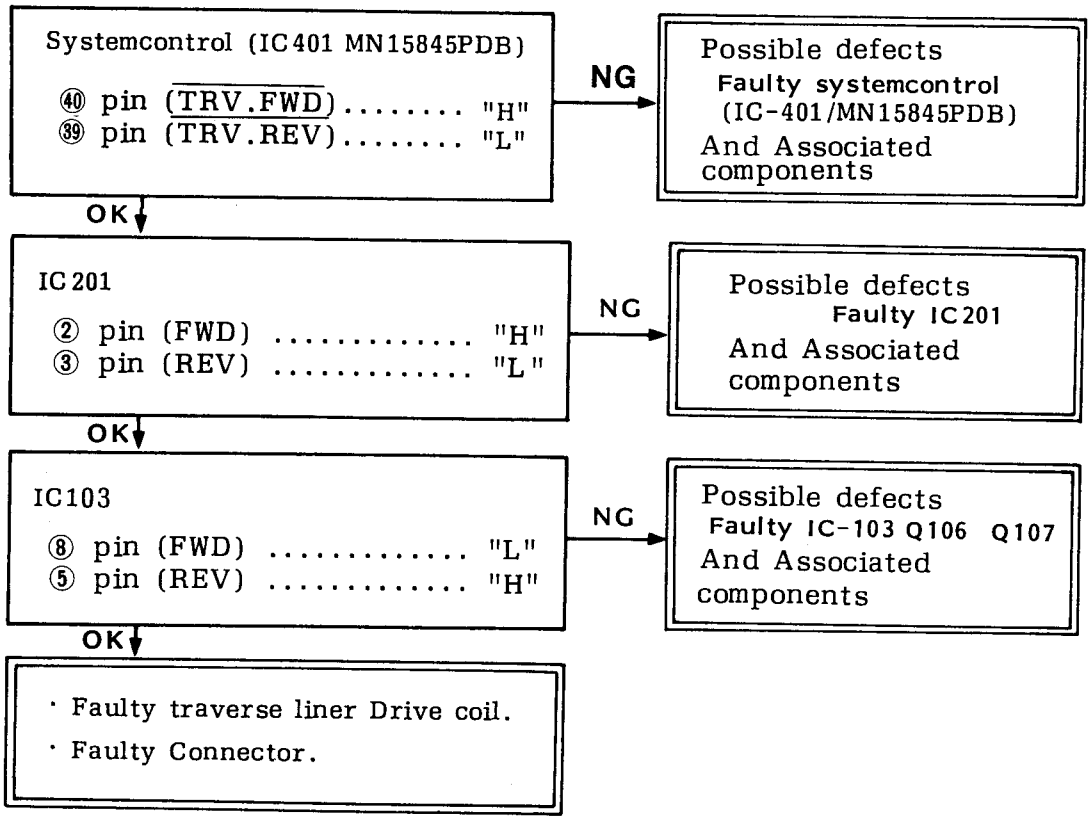
Sequence	Behavior	Faulty Circuit in no operation
①	Pick-up moves to in-most position by turning on power supply switch.	Traverse servo circuit (REV Mode)
②	Laser is ignited.	Optical Servo Circuit
③	Focus search	Optical servo circuit

(Note) Focus search is stopped in about 3 seconds if a disc is not placed. If stopped, turn on the power supply switch again.

Checking Steps and Probable Causes

Check the circuits supposed faulty from the above table with the oscilloscope in order.

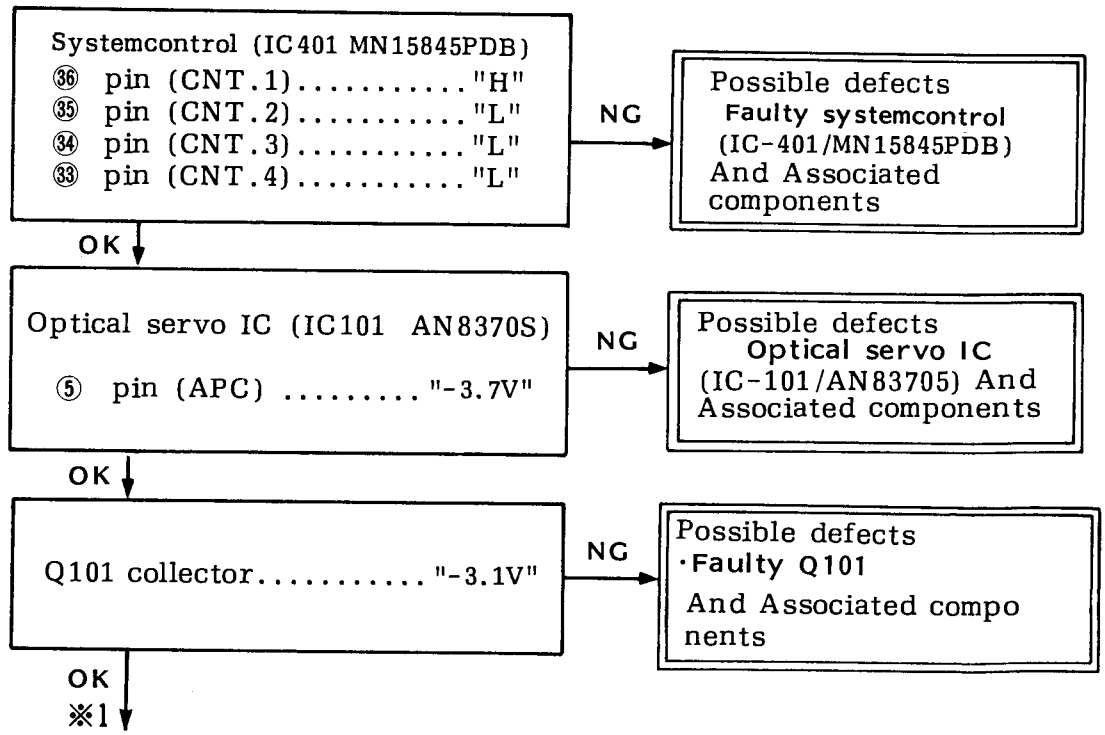
a). Traverse Servo Circuit (Reverse mode)



b). Traverse Servo Circuit (Forward mode)

The voltages shown in the above para. a) are reversed.

c). Optical Servo Circuit



*1

Possible defects
Faulty optical pick up if laser is not ignited.
(SOAD20A)
And Associated components

OK

Optical servo IC-101 (AN8370S)

㉒ pin (CNT.1) ..... "H"
㉓ pin (CNT.2) ..... "L"
㉔ pin (CNT.3) ..... "L"
㉕ pin (CNT.4) ..... "L"

NG → Faulty pattern from systemcontrol to optical servo IC (IC-101) CN201

OK

❸ Does search signal appear at pin ㉞ (S out) of optical servo IC101?

NG → Possible defects
Faulty optical servo IC101 (AN83705S)
And Associated components

OK

❸ Does search signal appear at pin ⑦ of IC104?

NG → Possible defects
Faulty IC104 (AN6554NS)
And Associated components

OK

❸ Does search signal appear at pin ⑧ of IC104?

NG → Possible defects
Faulty IC104 (AN6554NS)
And Associated components

OK

❸ Does search signal appear at collector of Q102 and Q103?

NG → Possible defects
Faulty Q102, Q103
And Associated components

OK

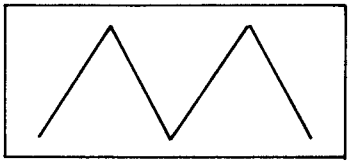
Is resistance of optical pick-up coil about 30Ω (across pins ⑦ and ⑧ of CN106

NG → Possible defects
Faulty optical pick-up (SOAD20A)
And Associated components

OK

S out.

❸



Mode : Focus Srrvo ON (About 3 sec)
Sweep: 0.5 sec
Volt : 2V
Input: AC

Faulty connector (CN106) or surrounding pattern

③ Turntable does not rotate.

Check Point

☆ The turntable starts to rotate after laser is ignited and focus search is made. The turntable, however, does not rotate if a disc is not placed. Must place a disc on the turntable.

a). Is a disc detected? ("H" level voltage at pin ⑭ of IC101)

b). Is the turntable rotate command is given from the systemcontrol to LSI?

c). Is the spindle motor drive signal given from LSI to the spindle motor? ("L" level voltage at pin ⑮ of LSI)

Checking Steps and Probable Causes

Check waveforms with the oscilloscope sequentially.

Does voltage at pin ⑭ (SENSE) of optical servo IC101 (AN8370S) turn to "H" level momentarily during focus search?

NG → Possible defects
Faulty optical servo IC
(IC-101/AU8370S)
And Associated components

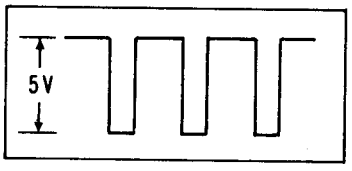
OK

❹ Do following signals appear at corresponding pins of systemcontrol (IC401 MN15845F)?
⑳ pin (MLD)... Pulse of about 25 ms
㉕ pin (MCLK).. Clock of about 25 ms
㉖ pin (MDATA) . M data

NG → Possible defects
Faulty systemcontrol
(IC-401/MN1S845PDB)
And Associated components

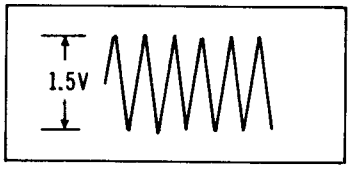
OK

❹ ⑳ Pin MLD



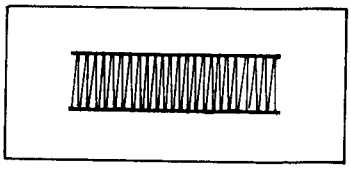
Mode : Pause/Play
Sweep: 20 µsec
Volt : 2V
Input: DC

❹ ㉕ Pin MCLK



Mode : Pause/Play
Sweep: 0.2 µsec
Volt : 0.5V
Input: AC

❹ ㉖ Pin MDATA



Mode : Play
Sweep: 5 ms
Volt : 0.5V
Input: AC

※

※

Is voltage at pin ⑭ (EC) of LSI (IC601 MN6617) "L" level?

NG

Possible defects
Faulty LSI
(IC-601/MN6617)
And Associated components

❺

Connector (CN701)
⑥ pin (EC)..... Pulse with standard voltage of 2.2V
⑤ pin (DCR).... +2.2V
④ pin (VEE).... -7.7V
③ pin (FG) .... FG pulse
② pin (VCC).... +7.7V
① pin (PC) .... -7.7V

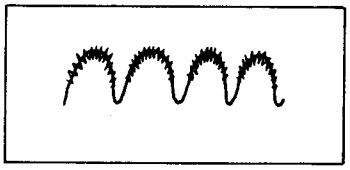
NG

Poor contact between FPC andconnector (CN106)
Faulty spindle PCB
(SXPD220)

Turntable height must be adjusted after replacement.

CN701 ⑥ Pin (EC)

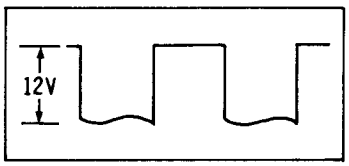
❺



Mode : Pause/Play
Sweep: 5 ms
Volt : 0.2V
Input: AC

CN701 ③ Pin (FG)

❺



Mode : Pause/Play
Sweep: 5 ms
Volt : 5V
Input: AC

④ RF signal is not output.

Check Point

☆ If the RF signal is not output, make check centering about the focus servo circuit.

a). Is the turntable height is correct?

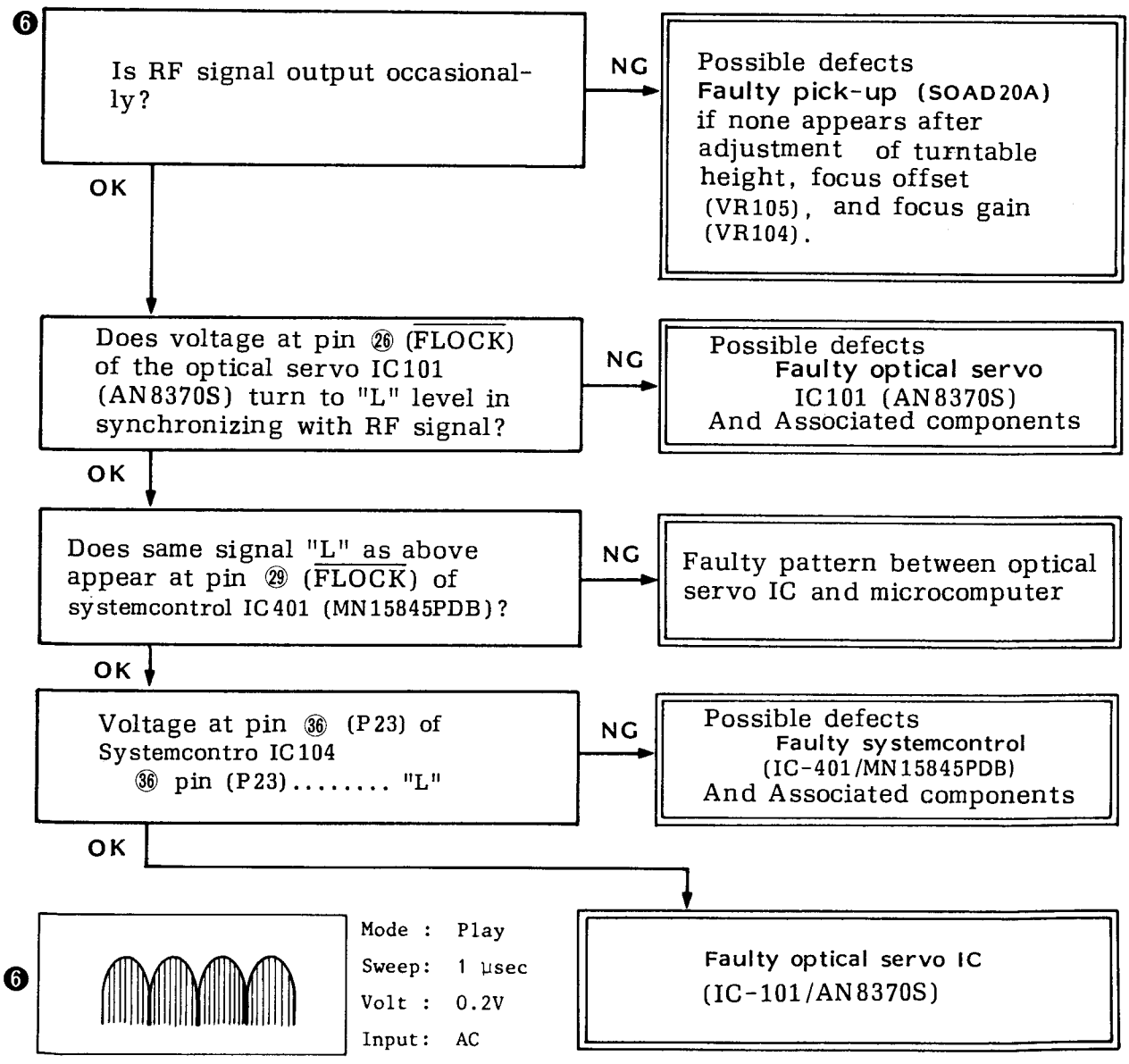
b). Is the focus offset setting is correct?

c). Is the focus gain setting is correct?

d). Is the focus servo loop opened?

Checking Steps and Probable Causes

Check waveforms and voltages with the oscilloscope sequentially.


❻
Is RF signal output occasionally?
NG
Possible defects
Faulty pick-up (SOAD20A)
if none appears after adjustment of turntable height, focus offset (VR105), and focus gain (VR104).
OK
Does voltage at pin ㉖ (FLOCK) of the optical servo IC101 (AN8370S) turn to "L" level in synchronizing with RF signal?
NG
Possible defects
Faulty optical servo IC101 (AN8370S)
And Associated components
OK
Does same signal "L" as above appear at pin ㉙ (FLOCK) of systemcontrol IC401 (MN15845PDB)?
NG
Faulty pattern between optical servo IC and microcomputer
OK
Voltage at pin ㊱ (P23) of Systemcontro IC104
㊱ pin (P23)..... "L"
NG
Possible defects
Faulty systemcontrol (IC-401/MN15845PDB)
And Associated components
OK
❻
Mode : Play
Sweep: 1 µsec
Volt : 0.2V
Input: AC
Faulty optical servo IC
(IC-101/AN8370S)

⑤ Tracking fails.

Check Points

☆ Make check centering about the tracking servo system because the waveform of RF signal suggests that the focus servo system functions normally.

a). Is tracking gain setting correct?

b). Is the command given from the microcomputer for closing the tracking servo loop? ("L" level signals at the pins ㉗ and ㉘ of IC401)

c). Is the tracking servo loop opened?

Checking Steps and Probable Causes

Check waveforms with the oscilloscope sequentially.

Does RF signal wave remain same by turning tracking gain adjustor (VR102)?
NG → Readjust.

OK ↓

Optical servo IC (IC101/AN8370S)
㉖ pin ($\overline{\text{FLOCK}}$)..... "L"
NG → Possible defects
Faulty optical servo IC101 (AN8370S) And Associated components

OK ↓

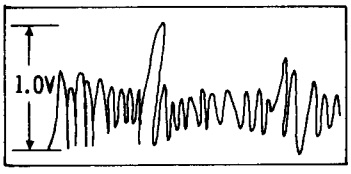
Systemcontrol (IC401 MN15845PDB)
㉟ pin (CNT.1)..... "L"
㊱ pin (CNT.2)..... "L"
NG → Possible defects
Faulty systemcontrol (IC-401/MN1S845PDB) And Associated components

OK ↓

❼ Does error signal appear at pin ⑥ (TEOUT) of optical servo IC101?
NG → Possible defects
Faulty optical servo IC (IC-101/AN8370S) And Associated components

OK ↓

※

❼ 

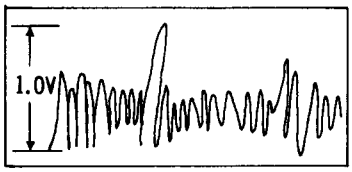
Mode : Play
Sweep: 0.2 ms
Volt : 50mV
Input: AC

※

❼ Does error signal appear at pin ① of IC104?

NG → Possible defects
Faulty IC104 (AN6554NS) And Associated components

OK

❼ 

Mode : Play
Sweep: 0.2 ms
Volt : 50mV
Input: AC

❽ Does error signal appear at pins ⑮ (HIN) and ⑯ (HOUT) of optical servo IC?

NG → Possible defects
Faulty optical servo IC (IC-101/AN8370S) And Associated components

OK

❽ Does error signal appear at pin ⑭ of IC104?

NG → Possible defects
Faulty IC104 (AN6554NS) And Associated components

OK

❽ Does error signal appear at the collectors of Q104 and Q105?

NG → Possible defects
Faulty Q104, Q105 And Associated components

OK

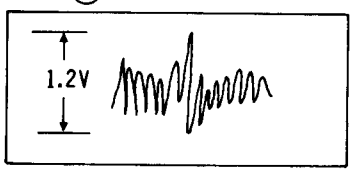
Is resistance of optical pick-up coil about 30Ω? (Across pins ⑤ and ⑥ of CN106)

NG → Possible defects
Faulty optical pick-up (SOAD20A) And Associated components

OK

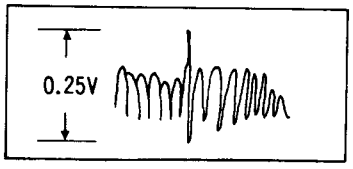
Faulty connector (CN106) or surrounding pattern

⑮ Pin H IN

❽ 

Mode : Pause/Play
Sweep: 0.2 msec.
Volt : 0.5V
Input: AC

⑯ Pin H OUT

❽ 

Mode : Pause/Play
Sweep: 0.2 msec.
Volt : 0.1V
Input: AC

⑥ RF is output but TOG is not read.

Check Points

☆ It may be concluded that the focus tracking servo functions, if the RF signal is output. Examine the transfer of data and primarily PLL and CLV.

a). Is the eye pattern is stretched enough?

b). Are the EFM and PCK signals output?

c). Is PLL locked?

d). Is CLV locked?

e). Are data transferred from LSI to systemcontrol?

Check Steps and Probable Causes

Check waveforms with the oscilloscope sequentially.

⑨ Is RF amplitude is about 1 V and is eye pattern stretched?
- NG → Proceed to Para.⑧. Sound skips or noise appears.
- OK ↓

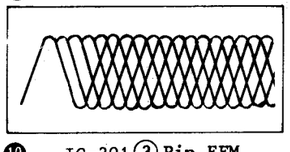
⑩ Do signals appear at pin ③ (EFM) and ⑤ (PCK) of PLL IC301 (AN8371S)?
- NG → Possible defects **Faulty PLL IC301 (AN8371S)** if RF signal appears at pin ⑮ (RF) of same IC. And Associated components
- OK ↓

Is voltage at pin ⑱ (FPC) of LSI (IC302 MN 6617) constantly +1.1 V?

Is voltage at pin ⑰ (CLVS) of LSI "H" level?
- → Possible defects **Faulty PLL IC301 (AN8371S)** if CLV is locked and PLL is not. Faulty spindle PCB (SXPD220) if CLV and PLL are not locked. And Associated components
- OK ↓

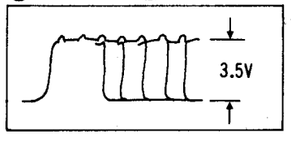
※

⑨



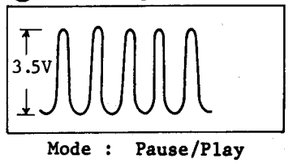
Mode : Pause/Play
Sweep: 0.5 µsec.
Volt : 0.2V
Input: AC

⑩ IC-301 ③ Pin EFM



Mode : Pause/Play
Sweep: 0.5 µsec.
Volt : 1.0V
Input: DC

⑩ IC301 ⑤ Pin PCK



Mode : Pause/Play
Sweep: 0.2 µsec.
Volt : 1.0V
Input: DC

※

⑪ Does LSI (IC601) output following signals?

Pin ① (BLKCK) ... 13.3 ms pulse
Pin ② (CLDCK) ... 136 µs pulse
Pin ③ (SUBQ) ... Q data

- → Possible defects **Faulty LSI** (GC-601/MU6617) And Associated components
- OK ↓

⑪ Are above signal input to following terminals of systemcontrol IC401 (MN15845PDB)?

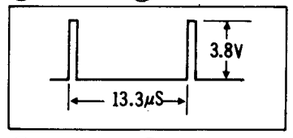
pin ⑯ (BLKCK).
pin ⑳ (CLDCK).
pin ⑱ (SUBQ).

- NG → **Pattern between LSI and microcomputer**
- ↓

Faulty systemcontro

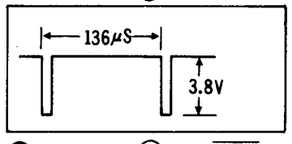
(IC-401/MU15845PDB)

⑪ IC-601 ① Pin BLKCK



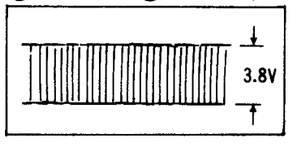
Mode : Play
Sweep: 5 ms
Volt : 1.0V
Input: AC/DC

⑪ IC-601 ② Pin $\overline{\text{CLDCK}}$



Mode : Pause/Play
Sweep: 50 µsec.
Volt : 1.0V
Input: DC

⑪ IC-601 ③ Pin $\overline{\text{SUBQ}}$



Mode : Pause/Play
Sweep: 5 msec.
Volt : 1.0V
Input: DC

⑦ Time is displayed but sound is not output.

a. Check Points

☆ The fact that time is displayed suggests that digital signal process and activities related to PLL IC and the microcomputer are normal.

– If sound is not output from the both channels, check the following items –

a). The muting control signal is output from the microcomputer?

b). Are 16 bit signals output from LSI?

c). Is the PAM signal is output from DAC?

– If only either of the channels does not output sound, check the audio circuit sequentially –

b. Checking Steps and Probable Causes

Check waveforms sequentially with the oscilloscope.

Is voltage at pin ㉜ (MUTE) of systemcontrol (IC401 MN 15845PDB)"L" level?
NG → Possible defects
Faulty systemcontrol
(IC-401/MN15845PDB)
And Associated components

OK

⑫ Do signals appear at pins ㉖ ∿ ㊷ (DA15 ∿ 0) of LSI (IC601 MN6617)? (However, pin ㉛ is GND terminal.)
NG → Possible defects
Faulty LSI
(IC-601/MN6617)
And Associated components

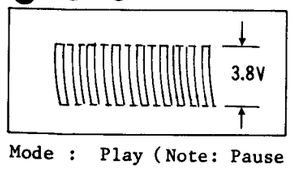
OK

⑬ Are above signals input to Pin ① ∿ Pin ⑯ (B1 ∿ B16) of DAC IC803 (SVIPCM54JP-V)?
NG → Possible defects
Faulty pattern between
LSI and DAC

OK

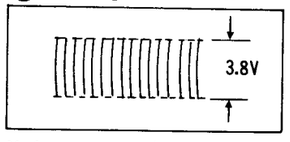
※

⑫ ㉖ ~ ㊷ pin DATA



Mode : Play (Note: Pause Mode → "H")
Sweep: 5 msec
Volt : 1.0V
Input: DC

⑬ ① ~ ⑯ Pin DATA



Mode : Play (Note: Pause Mode → "L")
Volt : 1.0V
Input: DC

※

⑭ Does PAM signal appear at pins ⑲ or ⑳ (OUT) of DAC (IC803)?
NG → Possible defects
Faulty DAC
(IC-801/SVIPCM54JP-V)
And Associated components

OK

⑮ Does deglitcher signal appears at pin ⑲ (L-CH) and ⑳ (R-CH) of LSI (IC601)?
NG → Possible defects
Faulty LSI
(IC-601/MN6617)
And Associated components

OK

⑯ Do signals appear at pin ⑦ (L-CH) and ① (R-CH) of IC-804?
NG → Possible defects
Faulty IC804
(SVINJM4560M/SVIUPD4053G)
And Associated components

OK

⑰ Does signal appear at pin ② (OUT) of IC801 and IC802?
IC-801 ..... L-ch
IC-802 ..... R-ch
NG → Possible defects
Faulty IC-801, IC-802
And Associated components

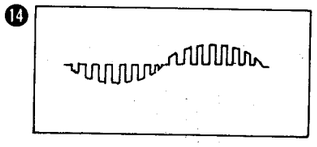
OK

Are signal levels of muting drive as stated below?
Q801 collector ..... "H"
NG → Possible defects
Faulty Q801
And Associated components

OK

Faulty relay

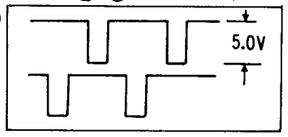
⑭



Mode : Play (Note: Pause Mode → "L")
Sweep: 0.2 msec.
Volt : 1.0V
Input: DC

⑲/⑳ Pin LDG/RDG

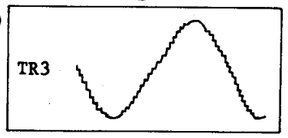
⑮



Mode : Pause/Play
Sweep: 10 µsec.
Volt : 2.0V
Input: DC

① ⑦ Pin

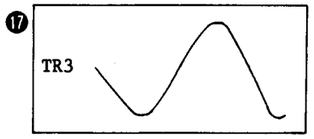
⑯



Mode : Play
Sweep: 0.5 msec.
Volt : 1.0V
Input: DC

IC 801/802

⑰



Mode : Play
Sweep: 0.2 msec.
Volt : 2.0V
Input: DC

⑧ Sound skips or noise is output.

Check Points

☆ The system is working anyhow because it reads TOC and starts play mode.

a). Are RF amplitude and eye-pattern stretch enough?

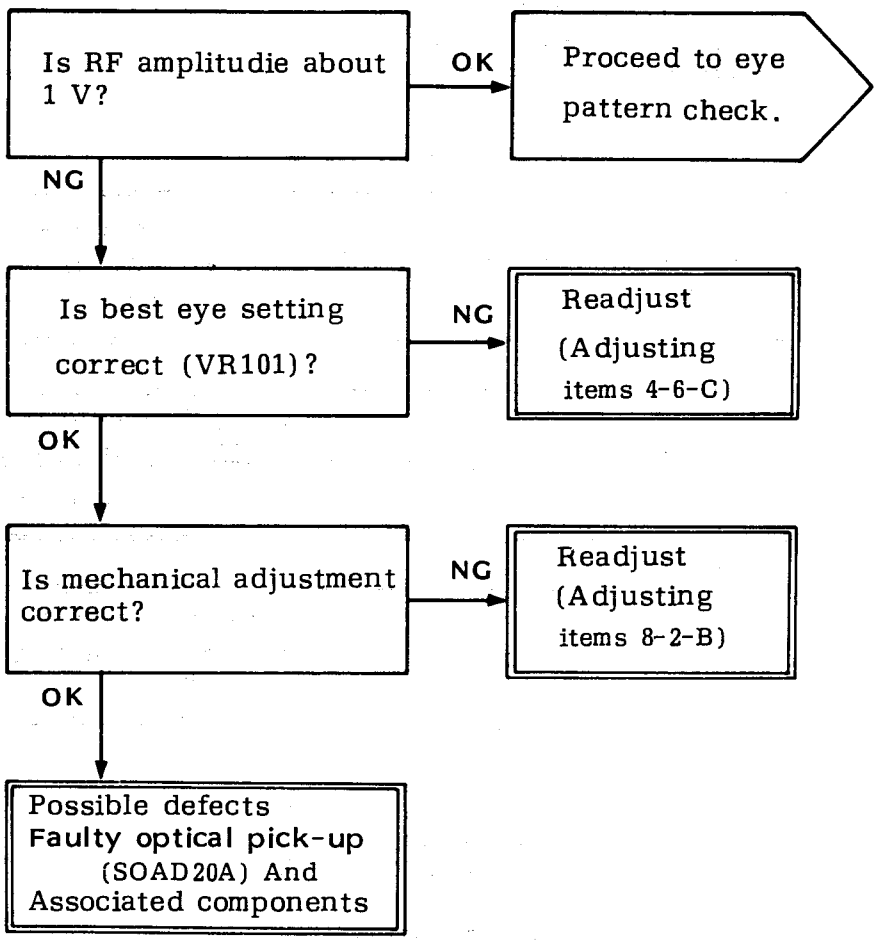
b). Is offset setting is correct?

c). Is servo gain setting is correct?

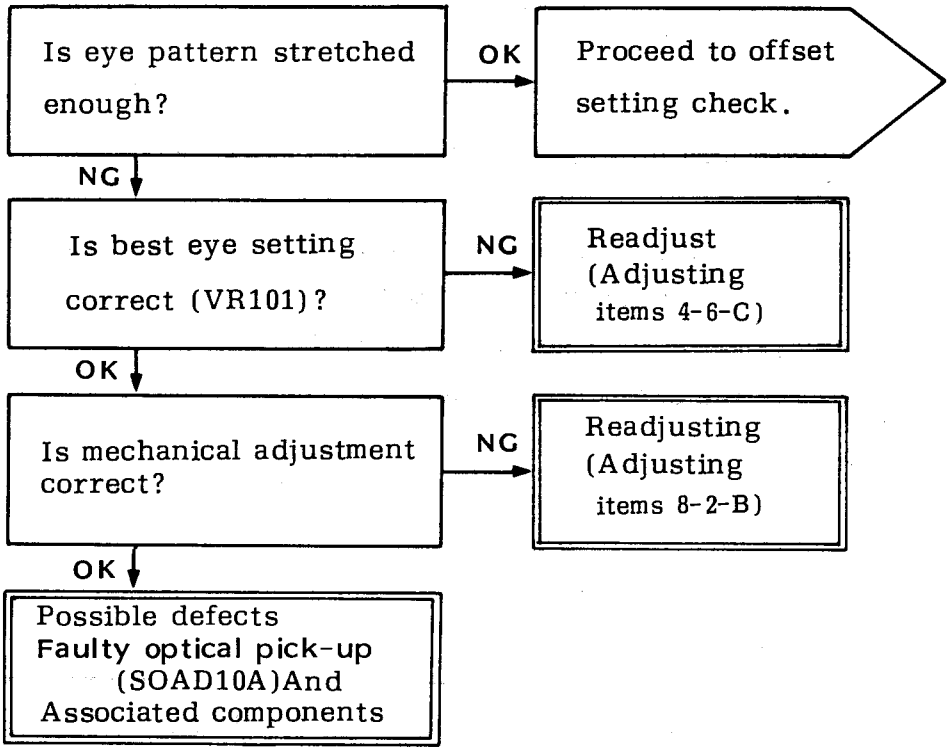
d). Is the correction ability of LSI enough?

b. Checking Steps and Probably Causes

● Check of RF Amplitude



● Check of Eye Pattern



● Check of Offset Setting